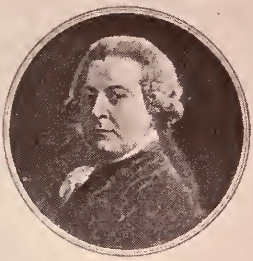

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# *MEDICAL INQUIRIES*

AND

# OBSERVATIONS.

# MEDICAL
# INQUIRIES
# AND
# OBSERVATIONS.

By BENJAMIN RUSH, M. D.
Professor of the Institutes of Medicine, and of
Clinical Practice in the University
of Pennsylvania.

## VOLUME I.

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To

JOHN REDMAN, M. D.

*Preſident of the College of Phyſicians of Philadelphia*

THIS SECOND AMERICAN EDITION

*of a* SMALL VOLUME *of*

MEDICAL INQUIRIES & OBSERVATIONS,

*is inſcribed,*

As a Mark of Reſpect for the Virtues and Talents,
which adorn his venerable Age,

By his affectionate

and grateful

former pupil,

BENJAMIN RUSH.

14th *June*, 1794.

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AN

# INQUIRY

INTO THE

# NATURAL HISTORY OF MEDICINE AMONG THE *INDIANS* OF *NORTH-AMERICA*.

AND A

# COMPARATIVE VIEW

OF THEIR

# DISEASES AND REMEDIES WITH THOSE OF CIVILIZED NATIONS.

Read before the AMERICAN PHILOSOPHICAL SOCIETY,
held at PHILADELPHIA, on the 4th of February, 1774.

GENTLEMEN*,

I RISE with peculiar diffidence to addreſs you upon this occaſion, when I reflect upon the entertainment you propoſed to yourſelves from the eloquence of that learned member, Mr CHARLES THOMPSON, whom your ſuffrages appointed to this honor after the delivery of the laſt anniverſary oration. Unhappily for the intereſts of literature, his want of health has not permitted him to comply with your appointment. I beg therefore that you would forget, for a while, the abilities neceſſary to execute this taſk with propriety, and liſten with candor to the efforts of a member, whoſe attachment to the ſociety was the only qualification that entitled him to the honor of your choice.

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* This INQUIRY was the ſubject of an Anniverſary Oration. The ſtyle of an oration is therefore preſerved in many parts of it.

The ſubject I have choſen for this evening's entertainment, is "An inquiry into the natural "hiſtory of medicine among the Indians in North "America, and a comparative view of their diſ"eaſes and remedies, with thoſe of civilized na"tions." You will readily anticipate the difficulty of doing juſtice to this ſubject. How ſhall we diſtinguiſh between the original diſeaſes of the Indians and thoſe contracted from their intercourſe with the Europeans? By what arts ſhall we perſuade them to diſcover their remedies? And laſtly, how ſhall we come at the knowledge of facts in that cloud of errors, in which the credulity of the Europeans, and the ſuperſtition of the Indians have involved both their diſeaſes and remedies? Theſe difficulties ſerve to increaſe the importance of our ſubject. If I ſhould not be able to ſolve them, perhaps I may lead the way to more ſucceſsful endeavours for that purpoſe.

I ſhall firſt limit the tribes of Indians who are to be the objects of this inquiry, to thoſe who inhabit that part of North-America which extends from the 30th to the 60th degree of latitude. When we exclude the Eſquimaux, who inhabit the ſhores of Hudſon's bay, we ſhall find a general reſemblance in the colour, manners and ſtate of ſociety, among all the tribes of Indians who inhabit the extenſive tract of country above-mentioned.

Civilians have divided nations into ſavage, barbarous, and civilized. The ſavage, live by fiſhing and hunting. The barbarous, by paſturage or cattle; and the civilized by agriculture. Each of theſe is connected together in ſuch a manner, that the whole appear to form different parts of a circle. Even the manners of the moſt civilized nations partake of thoſe of the ſavage. It would ſeem as if liberty and indolence were the higheſt purſuits of man; and theſe are enjoyed in their greateſt perfection by ſavages, or in the practice of cuſtoms which reſemble thoſe of ſavages.

The Indians of North-America partake chiefly of the manner of ſavages. In the earlieſt accounts we have of them, we find them cultivating a ſpot of ground. The maize is an original grain among them. The different diſhes of it which are in uſe among the white people ſtill retain Indian names.

It will be unneceſſary to ſhew that the Indians live in a ſtate of ſociety adapted to all the exigencies of their mode of life. Thoſe who look for the ſimplicity and perfection of the ſtate of nature, muſt ſeek it in ſyſtems, as abſurd in philoſophy, as they are delightful in poetry.

Before we attempt to aſcertain the number or hiſtory of the diſeaſes of the Indians, it will be neceſſary to inquire into thoſe cuſtoms among them which we know influence diſeaſes. For this purpoſe I ſhall,

Firſt, mention a few facts which relate to the birth and treatment of their children.

Secondly, I ſhall ſpeak of their diet.

Thirdly, Of the cuſtoms which are peculiar to the ſexes, And, Fourthly, Of thoſe cuſtoms which are common to them both*.

I. Of the birth and treatment of their children.

Much of the future health of the body depends upon its original ſtamina. A child born of healthy parents always brings into the world a ſyſtem formed by nature to reſiſt the cauſes of diſeaſes. The treatment of children among the Indians, tends to ſecure this hereditary firmneſs of conſtitution. Their firſt food is their mother's milk. To harden them againſt the action of heat and cold (the natural enemies of health and life among the Indians) they are plunged every day in cold water. In order to facilitate their being moved from place to place, and at the ſame time to preſerve their ſhape they are tied to a board, where they lie on their backs for ſix, ten, or eighteen months. A child generallly ſucks its mother till it is two years old, and ſometimes longer. It is eaſy to conceive how much vigour their bodies muſt acquire from this ſimple, but wholeſome nouriſhment. The appetite we ſometimes obſerve in children for fleſh is altogether artificial. The peculiar irritability of the ſyſtem in infancy, forbids ſtimulating aliment of all kinds. Nature never calls for animal food till ſhe has provided the child with thoſe teeth which are neceſſary to divide it. I ſhall not undertake to determine how far the wholeſome quality of the mother's milk is increaſed by her refuſing the embraces of her huſband, during the time of giving ſuck.

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* Many of the facts contained in the Natural Hiſtory of Medicine among the Indians in this Inquiry, are taken from La Hontan and Charlevoix's hiſtories of Canada; but the moſt material of them are taken from perſons who had lived, or travelled among the Indians. The author acknowledges himſelf indebted in a particular manner to Mr Edward Hand, ſurgeon in the 18th regiment, afterwards brigadier general in the army of the United States, who, during ſeveral years' reſidence at Fort Pitt, directed his inquiries into their cuſtoms, diſeaſes, and remedies, with a ſucceſs that does equal honour to his ingenuity and diligence.

II. The diet of the Indians is of a mixed nature, being partly animal and partly vegetable; their animals are wild, and therefore eaſy of digeſtion. As the Indians are naturally more diſpoſed to the indolent employment of fiſhing than hunting in ſummer, ſo we find them living more upon fiſh than land animals, in that ſeaſon of the year.—Their vegetables conſiſt of roots and fruits, mild in themſelves or capable of being made ſo by the action of fire. Although the interior parts of our continent abound with ſalt ſprings, yet I cannot find ſind that the Indians uſed ſalt in their diet, till they were inſtructed to do ſo by the Europeans. The ſmall quantity of fixed alkali contained in the aſhes on which they roaſted their meat, could not add much to its ſtimulating quality. They preſerve their meat from putrefaction, by cutting it into ſmall pieces, and expoſing it in ſummer to the ſun, and in winter to the froſt. In the one caſe its moiſture is diſſipated, and in the other ſo frozen, that it cannot undergo the putrefactive proceſs. In dreſſing their meat, they are careful to preſerve its juices. They generally prefer it in the form of ſoups. Hence we find, that among them the uſe of the ſpoon preceded that of the knife and fork. They take the ſame pains to preſerve the juice of their meat when they roaſt it, by turning it often. The efficacy of this animal juice in diſſolving meat in the ſtomach, has not been equalled by any of thoſe ſauces or liquors which modern luxury has mixed with it for that purpoſe.

The Indians have no ſet time for eating, but obey the gentle appetites of nature as often as they are called by them. After whole days ſpent in the chaſe or in war, they often commit thoſe exceſſes in eating, to which long abſtinence cannot fail of prompting them. It is common to ſee them ſpend three or four hours in ſatisfying their hunger. This is occaſioned not more by the quantity they eat, than by the pains they take in maſticating it. They carefully avoid drinking water in their marches, from an opinion that it leſſens their ability to bear fatigue.

III. We now come to ſpeak of thoſe cuſtoms which are peculiar to the ſexes. And, firſt, of thoſe which belong to the WOMEN. They are doomed by their huſbands to ſuch domeſtic labour as gives a firmneſs to their bodies, bordering upon the maſculine. Their menſes ſeldom begin to flow before they are eighteen or twenty years of age, and generally ceaſe before they are forty. They have them in ſmall quantities, but at regular intervals. They ſeldom marry till they are about twenty. The conſtitution has now acquired a vigour, which enables it the better to ſupport the convulſions of child-bearing. This cuſtom likewiſe guards againſt a premature old age. Doctor Bancroft aſcribes the haggard looks—the looſe hanging breaſts—and the prominent bellies of the Indian women at Guiana, entirely to their bearing children too early*. Where marriages are unfruitful (which is ſeldom the caſe) a ſeparation is obtained by means of an eaſy divorce; ſo that they are unacquainted with the diſquietudes which ſometimes ariſe from barrenneſs. During pregnancy, the women are exempted from the more laborious parts of their duty: hence miſcarriages rarely happen among them. Nature is their only midwife. Their labours are ſhort, and accompanied with little pain. Each woman is delivered in a private cabbin, without ſo much as one of her own ſex to attend her. After waſhing herſelf in cold water, ſhe returns in a few days to her uſual employments; ſo that ſhe knows nothing of thoſe accidents which proceed from the careleſſneſs or ill management of midwives; or thoſe weakneſſes which ariſe from a month's confinement in a warm room. It is remarkable that there is hardly a period in the interval between the eruption and the ceaſing of the menſes, in which they are not pregnant or giving ſuck. This is the moſt natural ſtate of the conſtitution during that interval; and hence we often find it connected with the beſt ſtate of health, in the women of civilized nations.

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* Natural Hiſtory of Guiana.

The cuſtoms peculiar to the Indian MEN, conſiſt chiefly in thoſe employments which are neceſſary to preſerve animal life, and to defend their nation. Theſe employments are hunting and war, each of which is conducted in a manner that tends to call forth every fibre into exerciſe, and to enſure them the poſſeſſion of the utmoſt poſſible health. In times of plenty and peace, we ſee them ſometimes riſing from their beloved indolence, and ſhaking off its influence by the ſalutary exerciſes of dancing and ſwimming. The Indian men ſeldom marry before they are thirty years of age: They no doubt derive conſiderable vigour from this cuſtom; for while they are ſecured by it from the enervating effects of the premature dalliance of love, they may enſure more certain fruitfulneſs to their wives, and entail more certain health upon their children. Tacitus deſcribes the ſame cuſtom among the Germans, and attributes to it the ſame good effects. "Sera juvenum venus, eoque in-"exhauſta pubertas; nec virgines feſtinantur; "eadem juventa, ſimilis proceritas, pares vali-"dique miſcentur; ac robora parentum liberi "referunt*.

Among the Indian men, it is deemed a mark of heroiſm to bear the moſt exquiſite pain without complaining; upon this account they early inure themſelves to burning part of their bodies with fire, or cutting them with ſharp inſtruments. No young man can be admitted to the honours of manhood or war, who has not acquitted himſelf well in theſe trials of patience and fortitude. It is eaſy to conceive how much this contributes to give a tone to the nervous ſyſtem, which renders it leſs ſubject to the occaſional cauſes of diſeaſes.

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* Cæſar, in his hiſtory of the Gallic war, gives the ſame account of the ancient Germans. His words are "Qui "diutiſſimi impuberes permanſerunt, maximam inter ſuos "ferunt laudem: hoc ali ſtaturam, ali vires, nervaſque con-"firmari putant." Lib. vi. xxi.

IV. We come now to ſpeak of thoſe cuſtoms which are common to both ſexes: Theſe are PAINTING, and the uſe of the COLD BATH. The practice of anointing the body with oil is common to the ſavages of all countries; in warm climates it is ſaid to promote longevity, by checking exceſſive perſpiration. The Indians generally uſe bear's greaſe mixed with a clay, which bears the greateſt reſemblance to the colour of their ſkins. This pigment ſerves to leſſen the ſenſibility of the extremities of the nerves; it moreover fortifies them againſt the action of thoſe exhalations, which we ſhall mention hereafter, as a conſiderable ſource of their diſeaſes. The COLD BATH likewiſe fortifies the body, and renders it leſs ſubject to thoſe diſeaſes which ariſe from the extremes and viciſſitudes of heat and cold. We ſhall ſpeak hereafter of the Indian manner of uſing it.

It is a practice among the Indians never to drink before dinner, when they work or travel. Experience teaches, that filling the ſtomach with cold water in the forenoon, weakens the appetite, and makes the ſyſtem more ſenſible of heat and fatigue.

The ſtate of ſociety among the Indians excludes the influence of moſt of thoſe paſſions which diſorder the body. The turbulent effects of anger are concealed in deep and laſting reſentments. Envy and ambition are excluded by their equality of power and property. Nor is it neceſſary that the perfections of the whole ſex ſhould be aſcribed to one, to induce them to marry. "The weak-"neſs of love (ſays Dr Adam Smith) which "is ſo much indulged in ages of humanity and "politeneſs, is regarded among ſavages as the "moſt unpardonable effeminacy. A young man "would think himſelf diſgraced for ever, if he "ſhewed the leaſt preference of one woman above "another, or did not expreſs the moſt complete "indifference, both about the time when, and "the perſon to whom, he was to be married*." Thus are they exempted from thoſe violent or laſting diſeaſes, which accompany the ſeveral ſtages of ſuch paſſions in both ſexes among civilized nations.

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* Theory of Moral Sentiments.

It is remarkable that there are no deformed Indians. Some have ſuſpected from this circumſtance, that they put their deformed children to death; but nature here acts the part of an unnatural mother. The ſeverity of the Indian manners deſtroy them *.

From a review of the cuſtoms of the Indians, we need not be ſurpriſed at the ſtatelineſs, regularity of features, and dignity of aſpect by whch they are characteriſed. Where we obſerve theſe among ourſelves, there is always a preſumption of their being accompanied with health, and a ſtrong conſtitution. The circulation of the blood is more languid in the Indians than in perſons who are in the conſtant exerciſe of the habits of civiliſed life. Out of eight Indian men whoſe pulſes I once examined at the wriſts, I did not meet with one in whom the artery beat more than ſixty-four ſtrokes in a minute.

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* Since the intercourſe of the white people with the Indians, we find ſome of them deformed in their limbs. This deformity, upon inquiry, appears to be produced by thoſe accidents, quarrels, &c. which have been introduced among them by ſpirituous liquors.

The marks of old age appear more early among Indian, than among civilized nations.

Having finiſhed our inquiry into the phyſical cuſtoms of the Indians, we ſhall now proceed to inquire into their diſeaſes.

A celebrated profeſſor of anatomy has aſſerted, that we could not tell by reaſoning *à priori*, that the body was mortal, ſo intimately woven with its texture are the principles of life. Lord Bacon declares, that the only cauſe of death which is natural to man, is that from old age ; and complains of the imperfection of phyſic, in not being able to guard the principle of life, until the whole of the oil that feeds it is conſumed. We cannot admit of this propoſition of our noble philoſopher. In the inventory of the grave in every country, we find more of the ſpoils of youth and manhood than of age. This muſt be attributed to moral as well as phyſical cauſes.

We need only recollect the cuſtom among the Indians, of ſleeping in the open air in a variable climate—the alternate action of heat and cold upon their bodies, to which the warmth of their cabins expoſes them—their long marches—their exceſſive exerciſe—their intemperance in eating, to which their long faſting, and their public feaſts naturally prompt them; and, laſtly, the vicinity of their habitations to the banks of rivers, in order to diſcover the empire of diſeaſes among them in every ſtage of their lives. They have in vain attempted to elude the general laws of mortality, while their mode of life ſubjects them to theſe remote, but certain cauſes of diſeaſes.

From what we know of the action of theſe potentiæ nocentes upon the human body, it will hardly be neceſſary to appeal to facts to determine that FEVERS conſtitute the only diſeaſes among the Indians. Theſe fevers are occaſioned by the ſenſible and inſenſible qualities of the air. Thoſe which are produced by cold, are of the inflammatory kind, ſuch as pleuriſies, peripneumonies, and rheumatiſms. Thoſe which are produced by the inſenſible qualities of the air, or by putrid exhalations, are intermitting, remitting, and inflammatory, according as the exhalations are combined with more or leſs heat or cold. The DYSENTERY (which is an Indian diſeaſe) comes under the claſs of fevers. It appears to be the febris introverſa of Dr Sydenham.

The Indians are ſubject to ANIMAL and VEGETABLE POISONS. The effects of theſe upon the body, are in ſome degree analogous to the exhalations we have mentioned. When they do not bring on ſudden death, they produce, according to their malignity, either an inflammatory or putrid fever.

The SMALL POX and the VENEREAL DISEASE were communicated to the Indians in North-America by the Europeans. Nor can I find that they were ever ſubject to the SCURVY. Whether this was obviated by their method of preſerving their fleſh, or by their mixing it at all times with vegetables, I ſhall not undertake to determine. Dr Maclurg aſcribes to freſh meat an antiſeptic quality *. The peculiar cuſtoms and manners of life among the Indians, ſeem to have exempted them from theſe, as well as all other diſeaſes of the fluids. The leproſy, elephantiaſis, ſcurvy, and venereal diſeaſe, appear to be different modifications of the ſame primary diſorder. The ſame cauſes produce them in every age and country. They are diverſified like plants by climate and nouriſhment. They all ſprung originally from a moiſt atmoſphere and unwholeſome diet; hence we read of their prevailing ſo much in the middle centuries, when the principal parts of Europe

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* Experiments on the Bile, and Reflections on the Biliary Secretion.

were overflowed with water, and the inhabitants lived entirely on fiſh, and a few unwholeſome vegetables. The abolition of the feudal ſyſtem in Europe, by introducing freedom, introduced at the ſame time agriculture; which by multiplying the fruits of the earth, leſſened the conſumption of animal food, and thus put a ſtop to theſe diſorders. The elephantiaſis is almoſt unknown in Europe. The leproſy is confined chiefly to the low countries of Africa. The plica polonica once ſo common in Poland, is to be found only in books of medicine. The ſmall pox is no longer a fatal diſorder, when the body is prepared for its reception by a vegetable regimen. Even the plague itſelf is loſing its ſting. It is hardly dreaded at this time in Turkey; and its very exiſtence is preſerved there by the doctrine of fataliſm, which prevails among the inhabitants of that country. It may ſerve as a new and powerful motive againſt political ſlavery to obſerve, that it is connected with thoſe diſeaſes which moſt deform and debaſe the human body. It may likewiſe ſerve to enhance the bleſſings of liberty, to trace its effects, in eradicating ſuch loathſome and deſtructive diſorders *.

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* Muratori, in his Antiquities of Italy in the middle ages, deſcribes the greateſt part of Europe as overflowed with water.

I have heard of two or three caſes of the GOUT among the Indians, but it was only among thoſe who had learned the uſe of rum from the white

The writings of the hiſtorians of thoſe ages are full of the phyſical and political miſeries which prevailed during thoſe centuries. The whole of the diſeaſes we have mentioned, raged at one time in all the countries of Europe. In the ninth century there were 19,000 hoſpitals for lepers only, in Chriſtendom. Lewis VIII. king of France, in the year 1227, bequeathed legacies to 2000 leprous hoſpitals in his own kingdom. The ſame diet, and the ſame dampneſs of ſoil and air, produced the ſame effects in South-America. The venereal diſeaſe probably made its appearance at the ſame time in South America and Naples. Precis de l'hiſtoire phyſique des tems, par M. Raymond. The leproſy and ſcurvy ſtill prevail in the northern parts of Europe, where the manner of living, among the inhabitants, ſtill bears ſome reſemblance to that which prevailed in the middle centuries. Pontopiddan's natural hiſtory of Norway. Between the years 1006 and 1680, we read of the plague being epidemic fifty-two times throughout all Europe. The ſituation of Europe is well known duing the fourteenth century: every country was in arms; agriculture was neglected; nouriſhment of all kinds was ſcanty and unwholeſome; no wonder, therefore, that we read of the plague being fourteen times epidemic in Europe during that period. In proportion as the nations of Europe have become civilized, and cultivated the earth, together with the arts of peace, this diſorder has gradually mitigated. It prevailed only ſix times in the ſixteenth, and five times in the ſeventeenth centuries. It made its laſt general appearance in the year 1680. It has occaſionally viſited ſeveral cities in Europe within people. A queſtion naturally occurs here, and that is, why does not the gout appear more frequently among that claſs of people, who conſume the greateſt quantity of rum among ourſelves? To this I anſwer, that the effects of this liquor upon thoſe enfeebled people, are too ſudden and violent, to admit of their being thrown upon the extremities; as we know them to be among the Indians. They appear only in viſceral obſtructions, and a complicated train of chronic diſeaſes. Thus putrid miaſmata are ſometimes too ſtrong to bring on a fever, but produce inſtant debility and death. The gout is ſeldom heard of in Ruſſia, Denmark, or Poland. Is this occaſioned by the vigour of conſtitution peculiar to the inhabitants of

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in the laſt century, but has raged with much leſs violence than formerly. It is highly probable its very exiſtence would be deſtroyed, could the inhabitants of Turkey (where it is at all times endemic) be prevailed upon to uſe the ſame precautions to prevent its ſpreading, which have been found ſucceſsful in other parts of Europe. The Britiſh, and other foreigners, who reſide at Conſtantinople, eſcape the plague more by avoiding all intercourſe with perſons, houſes, clothes, &c. infected with the diſorder, than by any peculiarities in their diet or manners. That the uſe of wine alone does not preſerve them from the infection, we learn from the hiſtory of the Armenians, who drink large quantities of wine; and yet, from their belief in the doctrine of fataliſm, periſh in the ſame proportion as the Turks.

thoſe northern countries? or is it cauſed by their exceſſive uſe of ſpirituous liquors, which produce the ſame chronic complaints among them, which we ſaid were common among the lower claſs of people in this country? The ſimilarity of their diſeaſes makes the laſt of theſe ſuppoſitions the moſt probable. The effects of wine, like tyranny in a well formed government, are felt firſt in the extremities; while ſpirits, like a bold invader, ſeize at once upon the vitals of the conſtitution.

After much inquiry, I have not been able to find a ſingle inſtance of MADNESS, MELANCHOLY, or FATUITY among the Indians; nor can I find any accounts of *diſeaſes* from WORMS among them. Worms are common to moſt animals; they produce diſeaſes only in weak, or increaſe them in ſtrong conſtitutions*. Hence they have no place in the noſological ſyſtems of phyſic. Nor does DENTITION appear to be a diſorder among the Indians. The facility with which the healthy children of healthy parents cut their teeth among civilized nations, gives us reaſon to conclude that the Indian children never ſuffer from this quarter.

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* Indian chidlren are not exempted from worms. It is common with the Indians, when a fever in their children is aſcribed by the white people to worms, (from their being diſcharged occaſionally in their ſtools) to ſay, "the fever "makes the worms come, and not the worms the fever."

The Indians appear moreover to be ſtrangers to diſeaſes and pains in the teeth.

The employments of the Indians ſubject them to many accidents; hence we ſometimes read of WOUNDS, FRACTURES, and LUXATIONS among them.

Having thus pointed out the natural diſeaſes of the Indians, and ſhewn what diſorders are foreign to them, we may venture to conclude, that FEVERS, OLD AGE, CASUALITIES and WAR, are the only natural outlets of human life. War is nothing but a diſtemper; it is founded in the imperfection of political bodies, juſt as fevers are founded on the weakneſs of the animal body.—Providence in theſe diſeaſes ſeems to act like a mild legiſlature which mitigates the ſeverity of death, by inflicting it in a manner the leaſt painful upon the whole to the patient and the ſurvivors.

Let us now inquire into the REMEDIES of the Indians. Theſe, like their diſeaſes, are ſimple, and few in number. Among the firſt of them we ſhall mention the POWERS OF NATURE. Fevers, we ſaid formerly, conſtituted the chief of the diſeaſes among the Indians; they are likewiſe, in the hands of nature, the principal inſtruments to remove the evils which threaten her diſſolution; but the event of theſe efforts of nature, no doubt, ſoon convinced the Indians of the danger of truſting her in all caſes; and hence in the earlieſt accounts we have of their manners, we read of perſons who were intruſted with the office of phyſicians.

It will be difficult to find out the exact order in which the Indian remedies were ſuggeſted by nature or diſcovered by art; nor will it be eaſy to arrange them in proper order. I ſhall however attempt it, by reducing them to NATURAL and ARTIFICIAL.

To the claſs of NATURAL REMEDIES belongs the Indian practice of abſtracting from their patients all kinds of ſtimulating aliment. The compliance of the Indians with the dictates of nature, in the early ſtage of a diſorder, no doubt, prevents in many caſes their being obliged to uſe any other remedy. They follow nature ſtill cloſer, in allowing their patients to drink plentifully of cold water; this being the only liquor a patient calls for in the fever.

Sweating is likewiſe a natural remedy. It was probably ſuggeſted by obſerving fevers to be terminated by it. I ſhall not inquire how far theſe ſweats are eſſential to the criſis of a fever. The Indian mode of procuring this evacuation is as follows: the patient is confined in a cloſe tent, or wigwam, over a hole in the earth, in which a red hot ſtone is placed; a quantity of water is thrown upon this ſtone, which inſtantly involves the patient in a cloud of vapour and ſweat; in this ſituation he ruſhes out, and plunges himſelf into a river; from whence he retires to his bed. If the remedy has been uſed with ſucceſs, he riſes from his bed in four and twenty hours, perfectly recovered from his indiſpoſition. This remedy is uſed not only to cure fevers, but remove that uneaſineſs which ariſes from fatigue of body.

A third natural remedy among the Indians, is PURGING. The fruits of the earth, the fleſh of birds, and other animals feeding upon particular vegetables, and above all the ſpontaneous efforts of nature, early led the Indians to perceive the neceſſity and advantages of this evacuation.

VOMITS conſtitute their fourth natural remedy. They were probably, like the former, ſuggeſted by nature, and accident. The ipecacuanha is one of the many roots they employ for this purpoſe.

The ARTIFICIAL REMEDIES made uſe of by the Indians, are BLEEDING, CAUSTICS, and ASTRINGENT medicines. They confine bleeding entirely to the part affected. To know that opening a vein in the arm, or foot, would relieve a pain in the head or ſide, ſuppoſes ſome knowledge of the animal economy, and therefore marks an advanced period in the hiſtory of medicine.

Sharp ſtones and thorns are the inſtruments they uſe to procure a diſcharge of blood.

We have an account of the Indians uſing ſomething like a POTENTIAL CAUSTIC, in obſtinate pains. It conſiſts of a piece of rotten wood called *punk*, which they place upon the part affected, and afterwards ſet it on fire; the fire gradually conſumes the wood, and its aſhes burn a hole in the fleſh.

The undue efforts of nature, in thoſe fevers which are connected with a diarrhœa, or dyſentery,

tery, together with thoſe hemorrhagies to which their mode of life expoſed them, neceſſarily led them to an early diſcovery of ſome ASTRINGENT VEGETABLES. I am uncertain whether the Indians rely upon aſtringent, or any other vegetables, for the cure of the intermitting fever. This diſeaſe among them probably requires no other remedies than the cold bath, or cold air. Its greater obſtinacy, as well as frequency among ourſelves, muſt be ſought for in the greater feebleneſs of our conſtitutions; and in that change which our country has undergone, from meadows, mill-dams and the cutting down of woods; whereby morbid exhalations have been multiplied, and their paſſage rendered more free, through every part of country.

This is a ſhort account of the remedies of the Indians. If they are ſimple, they are, like their eloquence, full of ſtrength; if they are few in number, they are accommodated, as their languages are to their ideas, to the whole of their diſeaſes.

We ſaid, formerly, that the Indians were ſubject to ACCIDENTS, ſuch as wounds, fractures, and the like. In theſe caſes, nature performs the office of a ſurgeon. We may judge of her qualifications for this office, by obſerving the marks of wounds and fractures, which are ſometimes diſcovered on wild animals. But further, what is the practice of our modern ſurgeons in theſe caſes? Is it not to lay aſide plaſters and ointments, and truſt the whole to nature? Thoſe ulcers which require the aſſiſtance of mercury, bark, and a particular regimen are unknown to the Indians.

The HEMORRAGES which ſometimes follow their wounds, are reſtrained by plunging themſelves into cold water, and thereby producing a conſtriction upon the bleeding veſſels.

Their practice of attempting to recover DROWNED PEOPLE, is irrational and unſucceſsful. It conſiſts in ſuſpending the patient by the heels, in order that the water may flow from his mouth. This practice is founded on a belief that the patient dies from ſwallowing an exceſſive quantity of water. But modern obſervation teaches us that drowned people die from another cauſe. This diſcovery has ſuggeſted a method of cure, directly oppoſite to that in uſe among the Indians; and has ſhewn us that the practice of ſuſpending by the heels is hurtful.

I do not find that the Indians ever ſuffer in their limbs from the action of COLD upon them. Their mokaſons*, by allowing their feet to move freely, and thereby promoting the circulation of the blood, defend their lower extremities in the day-time, and their practice of ſleeping with their feet near a fire, defends them from the morbid effects of cold at night. In thoſe caſes where the motion of their feet in their mokaſons is not ſufficient to keep them warm, they break the ice, and reſtore their warmth by expoſing them for a ſhort time to the ſtimulus of cold water†.

We have heard much of their ſpecific antidotes to the VENEREAL DISEASE. In the accounts of theſe antivenereal medicines, ſome abatement ſhould be made for that love of the marvellous, and of novelty, which are apt to creep into the writings of travellers and phyſicians. How many medicines which were once thought infallible in this diſorder, are now rejected from the materia medica! I have found upon enquiry that the Indians

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* Indian ſhoes.

† It was remarked in Canada, in the winter of the year 1759, during the war before laſt, that none of thoſe ſoldiers who wore mokaſons were froſt-bitten, while few of thoſe eſcaped that were much expoſed to the cold who wore ſhoes.

dians always aſſiſt their medicines in this diſeaſe, by a regimen which promotes perſpiration. Should we allow that mercury acts as a ſpecific in deſtroying this diſorder, it does not follow that it is proof againſt the efficacy of medicines which act more mechanically upon the body *.

There cannot be a ſtronger mark of the imperfect ſtate of knowledge in medicine among the Indians, than their method of treating the SMALL-POX. We are told that they plunge themſelves in cold water in the beginning of the diſorder, and that it generally proves fatal to them.

Travellers ſpeak in high terms of the Indian ANTIDOTES TO POISONS. We muſt remember, that many things have been thought poiſonous, which later experience hath proved to poſſeſs no unwholeſome quality. Moreover, the uncertainty and variety in the operation of poiſons, renders it extremely difficult to fix the certainty of the antidotes

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* I cannot help ſuſpecting the antivenereal qualities of the lobelia, ceanothus and ranunculus, ſpoken of by Mr Kalm, in the memoirs of the Swediſh academy. Mr Hand informed me, that the Indians rely chiefly upon a plentiful uſe of the decoctions of the pine-trees, againſt the venereal diſeaſe. He added moreover, that he had often known this diſeaſe prove fatal to them.

dotes to them. How many ſpecifics have derived their credit for preventing the hydrophobia, from perſons being wounded by animals, who were not in a ſituation to produce that diſorder! If we may judge of all the Indian antidotes to poiſons, by thoſe which have fallen into our hands, we have little reaſon to aſcribe much to them in any caſes whatever.

I have heard of their performing ſeveral remarkable cures upon STIFF JOINTS, by an infuſion of certain herbs in water. The mixture of ſeveral herbs together in this infuſion calls in queſtion the ſpecific efficacy of each of them. I cannot help attributing the whole ſucceſs of this remedy to the great heat of the water in which the herbs were boiled, and to its being applied for a long time to the part affected. We find the ſame medicine to vary frequently in its ſucceſs, according to its ſtrength, or to the continuance of its application. De Haen attributes the good effects of electricity, entirely to its being uſed for ſeveral months.

I have met with one caſe upon record of their aiding nature in PARTURITION. Captain Carver gives us an account of an Indian woman in a difficult labour, being ſuddenly delivered in conſequence of a general convulſion induced upon her ſyſtem, by ſtopping, for a ſhort time, her mouth and noſe, ſo as to obſtruct her breathing.

We are ſometimes amuſed with accounts of Indian remedies for the DROPSY, EPILEPSY, COLIC, GRAVEL and GOUT. If, with all the advantages which modern phyſicians derive from their knowledge in ANATOMY, CHEMISTRY, BOTANY and PHILOSOPHY; if, with the benefit of diſcoveries communicated from abroad, as well as handed down from our anceſtors, by more certain methods than tradition, we are ſtill ignorant of certain remedies for theſe diſeaſes; what can we expect from the Indians, who are not only deprived of theſe advantages, but want our chief motive, the ſenſe of the pain and danger of thoſe diſorders to prompt them to ſeek for ſuch remedies to relieve them? There cannot be a ſtronger proof of their ignorance of proper remedies for new or difficult diſeaſes, than their having recourſe to enchantment. But to be more particular; I have taken pains to inquire into the ſucceſs of ſome of theſe Indian ſpecifics, and have never heard of one well atteſted caſe of their efficacy. I believe they derive all their credit from our being ignorant of their compoſition. The influence of ſecrecy is well known in eſtabliſhing the credit of a medicine. The ſal ſeignette was an infallible medicine for the intermitting fever, while the manufactory of it was confined to an apothecary at Rochelle; but it loſt its virtues as ſoon as it was found to be compoſed of the acid of tartar and the foſſil alkali. Dr Ward's famous pill and drop ceaſed to do wonders in ſcrophulous caſes as ſoon as he bequeathed to the world his receipts for making them.

I foreſee an objection to what has been ſaid concerning the remedies of the Indians, drawn from that knowledge which experience gives to a mind intent upon one ſubject. We have heard much of the perfection of their ſenſes of ſeeing and hearing. An Indian, we are told, will diſcover not only a particular tribe of Indians by their footſteps, but the diſtance of time in which they were made. In thoſe branches of knowledge which relate to hunting and war, the Indians have acquired a degree of perfection that has not been equalled by civilized nations. But we muſt remember, that medicine among them does not enjoy the like advantages with the arts of war and hunting, of being the *chief* object of their attention. The phyſician and the warrior are united in one character; to render him as able in the former as he is in the latter profeſſion, would require an entire abſtraction from every other employment, and a familiarity with external objects, which are incompatible with the wandering life of ſavages.

Thus have we finiſhed our inquiry into the diſeaſes and remedies of the Indians in North-America. We come now to inquire into the diſeaſes and remedies of civilized nations.

Nations differ in their degrees of civilization. We ſhall ſelect one for the ſubject of our enquiries which is moſt familiar to us; I mean the Britiſh nation. Here we behold ſubordination and claſſes of mankind eſtabliſhed by government, commerce, manufactures, and certain cuſtoms common to moſt of the civilized nations of Europe. We ſhall trace the origin of their diſeaſes through their cuſtoms in the ſame manner as we did thoſe of the Indians.

I. It will be ſufficient to name the degrees of heat, the improper aliment, the tight dreſſes, and the premature ſtudies children are expoſed to, in order to ſhew the ample ſcope for diſeaſes, which is added to the original defect of ſtamina they derive from their anceſtors.

II. Civilization riſes in its demands upon the health of women. Their faſhions; their dreſs and diet; their eager purſuits and ardent enjoyment of pleaſure; their indolence and undue evacuations in pregnancy; their cordials, hot regimen and neglect or uſe of art, in child-birth, are all ſo many inlets to diſeaſes.

Humanity would fain be ſilent, while philoſophy calls upon us to mention the effects of intereſted marriages, and of diſappointments in love, increaſed by that concealment which the tyranny of cuſtom has impoſed upon the ſex*. Each of theſe exaggerates the natural, and increaſes the number of artificial diſeaſes among women.

III. The diſeaſes introduced by civilization extend themſelves through every claſs and profeſſion among men. How fatal are the effects of idleneſs and intemperance among the rich, and of hard labour and penury among the poor! What pallid looks are contracted by the votaries of ſcience from hanging over the "ſickly taper!" How many diſeaſes are entailed upon manufacturers, by the materials in which they work, and the poſture of their bodies! What monkiſh diſeaſes do we obſerve from monkiſh continence and monkiſh vices! We paſs over the increaſe of accidents from building, ſailing, riding, and the like. War, as if too ſlow in deſtroying the human ſpecies, calls in a train of diſeaſes peculiar to civilized nations. What havock have the corruption and monopoly of proviſions, a damp ſoil, and an unwholeſome ſky, made, in a few days, in an army! The atchievements of Britiſh valour at the Havannah, in the laſt war, were obtained at the expence of 9,000 men, 7,000 of whom periſhed with the Weſt India fever*. Even our modern diſcoveries in geography, by extending the empire of commerce, have likewiſe extended the empire of diſeaſes. What deſolation have the Eaſt and Weſt Indies made of Britiſh ſubjects! It has been found upon a nice calculation, that only ten of an hundred Europeans, live above ſeven years after they arrive in the iſland of Jamaica.

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* "Married women are more healthy and long-lived "than ſingle women. The regiſters, examined by Mr Muret, confirm this obſervation; and ſhow particularly, that "of equal numbers of ſingle and married women between "fifteen and twenty-five years of age, more of the former "died than of the latter, in the proportion of two to one: "the conſequence, therefore, of following nature muſt be "favourable to health among the female ſex." Supplement to Price's Obſervations on Reverſionary Payments. p. 357.

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* The modern writers upon the diſeaſes of armies, wonder that the Greek and Roman phyſicians have left us nothing upon that ſubject. But may not *moſt* of the diſeaſes of armies be produced by the different manner in which wars are carried on by the modern nations? The diſcoveries in geography, by extending the field of war, expoſe ſoldiers to many diſeaſes from long voyages, and a *ſudden* change of climate; which were unknown to the armies

IV. It would take up too much of our time to point out all the cuſtoms both *phyſical* and *moral*, which influence diſeaſes among both ſexes. The former have engendered the ſeeds of diſeaſes in the human body itſelf: hence the origin of catarrhs, jail and miliary fevers, with a long train of contagious diſorders, which compoſe ſo great a part of our books of medicine. The latter likewiſe have a large ſhare in producing diſeaſes. I am not one of thoſe modern philoſophers, who derive the vices of mankind from the influence of civilization; but I am ſafe in aſſerting, that their number and malignity increaſe with the refinements of poliſhed life. To prove this, we need only ſurvey a ſcene too familiar to affect us: it is

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armies of former ages. Moreover, the form of the weapons, and the variety in the military exerciſes of the Grecian and Roman armies, gave a vigour to the conſtitution, which can never be acquired by the uſe of muſkets and artillery.

a bed-a bedlam; which injuſtice, inhumanity, avarice, pride, vanity, and ambition, have filled with inhabitants.

Thus have we briefly pointed out the cuſtoms which influence the diſeaſes of civilized nations. It remains now that we take notice of their diſeaſes. Without naming the many new fevers, fluxes, hemorrhages, ſwellings from water, wind, fleſh, fat, pus and blood; foulneſſes on the ſkin from cancers, leproſy, yawes, poxes, and itch; and laſtly, the gout, the hyſteria, and the hypocondriaſis, in all their variety of known and unknown ſhapes; I ſhall ſum up all that is neceſſary upon this ſubject, by adding, that the number of diſeaſes which belong to civilized nations, according to Doctor Cullen's noſology, amounts to 1387; the ſingle claſs of nervous diſeaſes form 612 of this number.

Before we proceed to ſpeak of the remedies of civilized nations, we ſhall examine into the abilities of NATURE in curing their diſeaſes. We found her active and ſucceſsful in curing the diſeaſes of the Indians. Is her ſtrength, wiſdom, or benignity, equal to the increaſe of thoſe dangers which threaten her diſſolution among civilized nations? In order to anſwer this queſtion, it will be neceſſary to explain the meaning of the term nature.

By nature, in the preſent caſe, I underſtand nothing but *phyſical neceſſity*. This at once excludes every thing like intelligence from her operations: theſe are all performed in obedience to the ſame laws which govern vegetation in plants, and the inteſtine motions of foſſils. They are as truly mechanical as the laws of gravitation, electricity or magnetiſm. A ſhip when laid on her broadſide by a wave, or a ſudden blaſt of wind, riſes by the ſimple laws of her mechaniſm; but ſuppoſe this ſhip to be attacked by fire, or a water-ſpout, we are not to call in queſtion the ſkill of the ſhip-builder, if ſhe be conſumed by the one, or ſunk by the other. In like manner, the Author of nature hath furniſhed the body with powers to preſerve itſelf from its natural enemies; but when it is attacked by thoſe civil foes which are bred by the peculiar cuſtoms of civilization, it reſembles a company of Indians, armed with bows and arrows, againſt the complicated and deadly machinery of fire-arms. To place this ſubject in a proper light, we ſhall deliver a hiſtory of the operations of nature in a few of the diſeaſes of civilized nations.

I. There are caſes in which nature is ſtill ſucceſsful in curing diſeaſes.

In fevers ſhe ſtill deprives us of our appetite for animal food, and imparts to us a deſire for cool air and cold water.

In hemorrhages ſhe produces a faintneſs, which occaſions a coagulum in the open veſſels; ſo that the further paſſage of blood through them is obſtructed.

In wounds of the fleſh and bones ſhe diſcharges foreign matter by exciting an inflammation, and ſupplies the waſte of both with new fleſh and bone.

II. There are caſes where the efforts of nature are too feeble to do ſervice, as in putrid and nervous fevers.

III. There are caſes where the efforts of nature are over proportioned to the ſtrength of the diſeaſe, as in the cholera morbus and dyſentery.

IV. There are caſes where nature is idle, as in the atonic ſtages of the gout, the cancer, the epilepſy,

lepſy, the mania, the venereal diſeaſe, the apoplexy, and the tetanus*.

V. There are caſes in which nature does miſchief. She waſtes herſelf with an unneceſſary fever, in a dropſy and conſumption. She throws a plethora upon the brain and lungs in the apoplexy and peripneumonia notha. She ends a pleuriſy and peripneumony in a vomica, or empyema. She creates an unnatural appetite for food in the hypochondriac diſorder. And laſtly, ſhe drives the melancholy patient to ſolitude, where, by brooding over the ſubject of his inſanity, he increaſes his diſeaſe.

We are accuſtomed to hear of the ſalutary kindneſs of nature in alarming us with pain, to prompt us to ſeek for a remedy. But,

VI. There are caſes in which ſhe refuſes to ſend this harbinger of the evils which threaten her, as in the aneuriſm, ſcirrhus, and ſtone in the bladder.

VII. There are caſes where the pain is not proportioned to the danger, as in the tetanus, conſumption, and dropſy of the head. And,

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* Hoffman de hypotheſium medicarum damno, ſect. xv.

VIII. There are caſes where the pain is over-proportioned to the danger, as in the paronychia and tooth-ach.

This is a ſhort account of the operations of nature, in the diſeaſes of civilized nations. A lunatic might as well plead againſt the ſequeſtration of his eſtate, becauſe he once enjoyed the full exerciſe of his reaſon, or becauſe he ſtill had lucid intervals, as nature be exempted from the charges we have brought againſt her.

But this ſubject will receive ſtrength from conſidering the REMEDIES of civilized nations. All the products of the vegetable, foſſil, and animal kingdoms, tortured by heat and mixture into an almoſt infinite variety of forms; bleeding, cupping, artificial drains by ſetons, iſſues, and bliſters; exerciſe, active and paſſive; voyages and journies; baths, warm and cold; waters ſaline, aërial and mineral; food by weight and meaſure; the royal touch; enchantment; miracles; in a word, the combined diſcoveries of natural hiſtory and philoſophy, united into a ſyſtem of materia medica, all ſhow, that although phyſicians are in ſpeculation the ſervants, yet in practice they are the maſters of nature. The whole of their remedies ſeem contrived on purpoſe to arouſe, aſſiſt, reſtrain, and controul her operations.

There are ſome truths like certain liquors, which require ſtrong heads to bear them. I feel myſelf protected from the prejudices of vulgar minds, when I reflect that I am delivering theſe ſentiments in a ſociety of philoſophers.

Let us now take a COMPARATIVE VIEW of the diſeaſes and remedies of the Indians with thoſe of civilized nations. We ſhall begin with their diſeaſes.

In our account of the diſeaſes of the Indians we beheld death executing his commiſſion, it is true; but then his dart was hid in a mantle, under which he concealed his ſhape. But among civilized nations we behold him multiplying his weapons in proportion to the number of organs and functions in the body; and pointing each of them in ſuch a manner, as to render his meſſengers more terrible than himſelf.

We ſaid formerly that fevers conſtituted the chief diſeaſes of the Indians. According to Doctor Sydenham's computation, above 66,000 out of 100,000 died of fevers in London about 100 years ago; but fevers now conſtitute but a little more than one-tenth part of the diſeaſes of that city. Out of 21,780 perſons who died in London between December 1770 and December 1771, only 2273 died of ſimple fevers. I have more than once heard Doctor Huck complain, that he could find no marks of epidemic fevers in London as deſcribed by Dr Sydenham. London has undergone a revolution in its manners and cuſtoms ſince Doctor Sydenham's time. New diſeaſes, the offspring of luxury, have ſupplanted fevers; and the few that are left, are ſo complicated with other diſeaſes that their connection can no longer be diſcovered with an epidemic conſtitution of the year. The pleuriſy and peripneumony thoſe inflammatory fevers of ſtrong conſtitutions, are now loſt in catarrhs, or colds; which inſtead of challenging the powers of nature or art to a fair combat, inſenſibly undermine the conſtitution, and bring on an incurable conſumption. Out of 22,434 who died in London between December 1769, and the ſame month in 1770, 4594 periſhed with that *Britiſh* diſorder. Our countryman, Doctor Maclurg, has ventured to foretel that the gout will be loſt in a few years, in a train of hypocondriac, hyſteric and bilious diſorders. In like manner, may we not look for a ſeaſon when fevers, the natural diſeaſes of the human body, will be loſt in an inundation of artificial diſeaſes, brought on by the modiſh practices of civilization?

It may not be improper to compare the PROGNOSIS of the Indians, in diſeaſes, with that of civilized nations, before we take a comparative view of their remedies.

The Indians are ſaid to be ſucceſsful in predicting the events of diſeaſes. While diſeaſes are ſimple, the marks which diſtinguiſh them, or characterize their ſeveral ſtages, are generally uniform and obvious to the moſt indifferent obſerver. Theſe marks afford ſo much certainty, that the Indians ſometimes kill their phyſicians for a falſe prognoſis, charging the death of the patient to their careleſſneſs, or ignorance. They eſtimate the danger of their patients by the degrees of appetite; while an Indian is able to eat, he is looked upon as free from danger. But when we conſider the number and variety in the ſigns of diſeaſes, among civilized nations, together with the ſhortneſs of life, the fallacy of memory, and the uncertainty of obſervation, where ſhall we find a phyſician willing to riſk his reputation, much leſs his life, upon the prediction of the event of our acute diſeaſes? We can derive no advantage from the ſimple ſign, by which the Indians eſtimate the danger of their patients; for we daily ſee a want of appetite for food in diſeaſes which are attended with no danger; and we ſometimes obſerve an unuſual degree of this appetite to precede the agonies of death. I honour the name of HIPPOCRATES: But forgive me ye votaries of antiquity, if I attempt to pluck a few grey hairs from his venerable head. I was once an idolater at his altar, nor did I turn apoſtate from his worſhip, till I was taught, that not a tenth part of his prognoſtics correſponded with modern experience, or obſervation. The pulſe *, urine, and ſweats, from which the principle ſigns of life and death have been taken, are ſo variable in moſt of the acute diſeaſes of civilized nations, that the wiſeſt phyſicians have in ſome meaſure excluded the prognoſis from being a part of their profeſſion.

I am here inſenſibly led to make an apology for the inſtability of the theories and practice of phyſic. The theory of phyſic is founded upon the laws of the animal economy. Theſe (unlike

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* Doctor Cullen uſed to inform his pupils, that after forty years experience, he could find no relation between his own obſervations on the pulſe, and thoſe made by Doctor Solano. The climate and cuſtoms of the people in Spain being ſo different from the climate and cuſtoms of the preſent inhabitants of Britain, may account for the diverſity of their obſervations. Doctor Heberden's remarks upon the pulſe, in the ſecond volume of the Medical Tranſactions, are calculated to ſhow how little the iſſue of diſeaſes can be learned from it.

the laws of the mind, or the common laws of matter) do not appear at once, but are gradually brought to light by the phænomena of diſeaſes. The ſucceſs of nature in curing the ſimple diſeaſes of Saxony, laid the foundation for the ANIMA MEDICA of Doctor STAHL. The endemics of Holland * led Doctor BOERHAAVE to ſeek for the cauſes of all diſeaſes in the FLUIDS. And the univerſal prevalence of the diſeaſe of the NERVES, in Great-Britain, led Doctor CULLEN to diſcover their peculiar laws, and to found a ſyſtem upon them; a ſyſtem, which will probably laſt till ſome new diſeaſes are let looſe upon the human ſpecies, which ſhall unfold other laws of the animal œconomy.

It is in conſequence of this fluctuation in the principles and practice of phyſic, being ſo neceſſarily connected with the changes in the cuſtoms of

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* "The ſcurvy is very frequent in Holland; and draws its origin partly from their ſtrong food, ſea-fiſh, and ſmoaked fleſh, and partly from their denſe and moiſt air, together with their bad water." Hoffman on Endemical Diſtempers.

"We are now in North-Holland; and I have never ſeen, among ſo few people, ſo many infected with the leproſy as here. They ſay the reaſon is, becauſe they eat ſo much fiſh." Howell's Familiar Letters.

of civilized nations, that old and young phyſicians ſo often diſagree in their opinions and practices. And it is by attending to the conſtant changes in theſe cuſtoms of civilized nations, that thoſe phyſicians have generally become the moſt eminent, who have ſooneſt emancipated themſelves from the tyranny of the ſchools of phyſic; and having occaſionally accommodated their principles and practice to the changes in diſeaſes *. This variety in diſeaſes, which is produced by the changes in the cuſtoms of civilized nations, will enable us to account for many of the contradictions which are to be found in authors of equal candour and abilities, who have written upon the materia medica.

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* We may learn from theſe obſervations, the great impropriety of thoſe Egyptians laws which oblige phyſicians to adopt, in all caſes, the preſcriptions which had been collected, and approved of, by the phyſicians of former ages. Every change in the cuſtoms of civilized nations, produces a change in their diſeaſes, which calls for a change in their remedies. What havoc would plentiful bleeding, purging, and ſmall beer, formerly uſed with ſo much ſucceſs by Dr Sydenham in the cure of fevers, now make upon the enfeebled citizens of London! The fevers of the ſame, and of more ſouthern latitudes, ſtill admit of ſuch antiphlogiſtic remedies. In the room of theſe, bark, wine, and other cordial medicines, are preſcribed in London in almoſt every kind of fever.

In forming a comparative view of the REMEDIES of the Indians, with thoſe of civilized nations, we ſhall remark, that the want of ſucceſs in a medicine is occaſioned by one of the following cauſes.

Firſt, our ignorance of the diſorder. Secondly, an ignorance of a ſuitable remedy. Thirdly, a want of efficacy in the remedy.

Conſidering the violence of the diſeaſes of the Indians, it is probable their want of ſucceſs is always occaſioned by a want of efficacy in their medicines. But the caſe is very different among the civilized nations. Diſſections daily convince us of our ignorance of the ſeats of diſeaſes, and cauſe us to bluſh at our preſcriptions. What certain or equal remedies have we found for the gout, the epilepſy, apoplexy, palſy, dropſy of the brain, cancer and conſumption? How often are we diſappointed in our expectation from the moſt certain and powerful of our remedies, by the negligence or obſtinacy of our patients! What miſchief have we done under the belief of falſe facts (if I may be allowed the expreſſion) and falſe theories! We have aſſiſted in multiplying diſeaſes.—We have done more—we have increaſed their mortality.

I ſhall not pauſe to beg pardon of the faculty, for acknowledging in this public manner the weakneſſes of our profeſſion. I am purſuing truth, and while I can keep my eye fixed upon my guide, I am indifferent whither I am led, provided ſhe is my leader.

But further, the Indian ſubmits to his diſeaſe, without one fearful emotion from his doubtfulneſs of its event; and at laſt meets his fate without an anxious wiſh for futurity; except it is of being admitted to an "equal ſky," where

"His faithful dog ſhall bear him company."

But among civilized nations, the influence of a falſe religion in good, and of a true religion in bad men, has converted even the fear of death into a diſeaſe. It is this original diſtemper of the imagination which renders the plague moſt fatal, upon his firſt appearance in a country.

Under all theſe diſadvantages in the ſtate of medicine, among civilized nations, do more in proportion die of the diſeaſes peculiar to them, than of fevers, caſualties and old age, among the Indians? If we take our account from the city of London, we ſhall find this to be the caſe. Near a twentieth part of its inhabitants periſh one year with another. Nor does the natural increaſe of inhabitants ſupply this yearly waſte. If we judge from the bills of mortality, the city of London contains fewer inhabitants, by ſeveral thouſands, than it did forty years ago. It appears from this fact, and many others of a like nature, which might be adduced, that although the difficulty of ſupporting children, together with ſome peculiar cuſtoms of the Indians, which we mentioned, limit their number, yet they multiply faſter, and die in a ſmaller proportion than civilized nations, under the circumſtances we have deſcribed. The Indians, we are told, were numerous in this country before the Europeans ſettled among them. Travellers agree likewiſe in deſcribing numbers of both ſexes who exhibited all the marks of extreme old age. It is remarkable that age ſeldom impairs the faculties of their minds.

The mortality peculiar to thoſe Indian tribes who have mingled with the white people, muſt be aſcribed to the extenſive miſchief of ſpirituous liquors. When theſe have not acted, they have ſuffered from having accommodated themſelves too ſuddenly to the European diet, dreſs, and manners. It does not become us to pry too much into futurity; but if we may judge from the fate of the original natives of Hiſpaniola, Jamaica, and the provinces on the continent, we may venture to foretell, that, in proportion as the white people multiply, the Indians will diminiſh; ſo that in a few centuries they will probably be entirely extirpated *.

It may be ſaid, that health among the Indians, like inſenſibility to cold and hunger, is proportioned to their need of it; and that the leſs degrees, or entire want of health, are no interruption to the ordinary buſineſs of civilized life.

To obviate this ſuppoſition, we ſhall firſt attend to the effects of a ſingle diſtemper in thoſe people who are the principle wheels in the machine of civil ſociety. Juſtice has ſtopt its current, victories, have been loſt, wars have been prolonged, and

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* Even the influence of CHRISTIAN principles has not been able to put a ſtop to the mortality introduced among the Indians, by their intercourſe with the Europeans. Dr Cotton Mather, in a letter to Sir William Aſhurſt, printed, in Boſton in the year 1705, ſays "That about five years before, there were about thirty Indian congregations in the ſouthern parts of the province of Maſſachuſetts-Bay." The ſame author, in his hiſtory of New-England, ſays, "That in the iſlands of Nantucket and Martha's Vineyard, there were 3000 *adult* Indians, 1600 of whom profeſſed the Chriſtian religion." At preſent there is but *one* Indian congregation in the whole Maſſachuſetts province.

embaſſies delayed, by the principle actors in theſe departments of government being ſudddenly laid up by a fit of the gout. How many offences are daily committed againſt the rules of good breeding, by the tedious hiſtories of our diſorders, which compoſe ſo great a part of modern converſation! What ſums of money have been laviſhed in foreign countries in purſuit of health*! Families have been ruined by the unavoidable expences of medicines and watering-places. In a word, the ſwarms of beggars which infeſt ſo many of the European countries, urge their petitions for charity chiefly by arguments derived from real or counterfeit diſeaſes, which render them incapable of supportin themſelves†.

But may not civilization, while it abates the violence of natural diſeaſes, increaſe the lenity of

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It may ſerve to extend our knowledge of diſeaſes, to remark, that epidemics were often obſerved to prevail among the Indians in Nantucket, without affecting the white people.

[*] It is ſaid, there are ſeldom leſs than 20,000 Britiſh ſubjects in France and Italy; one half of whom reſide or travel in thoſe countries upon the account of their health.

[†] Templeman computes, that Scotland contains 1,500,000 inhabitants; 100,000 of whom, according to Mr Fletcher, are ſupported at the public expence. The proportion of poor people is much greater in England, Ireland, France, and Italy.

thoſe that are artificial, in the ſame manner that it leſſens the ſtrength of natural vices by multiplying them? To anſwer this queſtion, it will only be neceſſary to aſk another: Who ſhould exchange the heat, thirſt and uneaſineſs of a fever, for one fit of the cholic or ſtone?

The hiſtory of the number, combination and faſhions af the remedies we have given, may ſerve to humble the pride of philoſophy; and to convince us that with all the advantages of the whole circle of ſciences, we are ſtill ignorant of antidotes to many of the diſeaſes of civilized nations. We ſometimes ſooth our ignorance by reproaching our idleneſs in not inveſtigating the remedies peculiar to this country. We are taught to believe that every herb that grows in our woods is poſſeſſed of ſome medicinal virtue, and that heaven would be wanting in benignity if our country did not produce remedies for all the different diſeaſes of its inhabitants. It would be arrogating too much to ſuppoſe that man was the only creature in our world for whom vegetables grow. The beaſts, birds and inſects, derive their ſuſtenance either directly or indirectly from them; while many of them were probably intended from their variety in figure, foliage and colour, only to ſerve as ornaments for our globe. It would ſeem ſtrange that the Author of nature ſhould furniſh every ſpot of ground with medicines adapted to the diſeaſes of its inhabitants, and at the ſame time deny it the more neceſſary articles of food and cloathing. I know not whether heaven has provided every country with antidotes even to the *natural* diſeaſes of its inhabitants. The intermitting fever is common in almoſt every corner of the globe; but a ſovereign remedy for it has been diſcovered only in South-America. The combination of bitter and aſtringent ſubſtances, which ſerve as a ſuccedaneum to the Peruvian bark, is as much a preparation of art, as calomel or tartar emetic. Societies ſtand in need of each other as much as individuals: and the goodneſs of the Deity remains unimpeached when we ſuppoſe, that he intended medicines to ſerve (with other articles) to promote that knowedge, humanity, and politeneſs among the inhabitants of the earth, which have been ſo juſtly attributed to commerce.

We have no diſcoveries in the materia medica to hope for from the Indians in North-America It would be a reproach to our ſchools of phyſic, if modern phyſicians were not more ſucceſsful than the Indians, even in the treatment of their own diſeaſes.

Do the bleſſings of civilization compenſate for the ſacrifice we make of natural health, as well as of natural liberty? This queſtion muſt be anſwered under ſome limitations. When natural liberty is given up for laws which enſlave inſtead of protecting us, we are immenſe loſers by the exchange. Thus, if we arm the whole elements againſt our health, and render every pore in the body an avenue for a diſeaſe, we pay too high a price for the bleſſings of civilization.

In governments which have departed entirely from their ſimplicity, partial evils are to be cured by nothing but an entire renovation of their conſtitution. Let the world bear with the profeſſions of law, phyſic, and divinity; and let the lawyer, phyſician and divine yet learn to bear with each other. They are all neceſſary, in the preſent ſtate of ſociety. In like manner, let the women of faſhion forget the delicacy of her ſex, and ſubmit to be delivered by a man-midwife*. Let her ſnatch her offspring from her breaſt, and ſend it to repair

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* In the enervated age of Athens, a law was paſſed which confined the practice of midwifery only to the men. It was, however, repealed, upon a woman's dying in childbirth, rather than be delivered by a man-midwife. It appears from the bills of mortality in London and Dublin, that about one in ſeventy of thoſe women die in childbirth who are in the

hands

the weakneſs of its ſtamina, with the milk of a ruddy cottager*. Let art ſupply the place of nature in the preparation and digeſtion of all our aliment. Let our fine ladies keep up their colour with carmine, and their ſpirits with ratifia; and let our fine gentlemen defend themſelves from the exceſſes of heat and cold, with lavender and hartſhorn. Theſe cuſtoms have become neceſſary in the corrupt ſtages of ſociety. We muſt imitate, in theſe

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hands of midwives; but from the accounts of the lying-in hoſpitals in thoſe cities which are under the care of man-midwives, only one in an hundred and forty periſhes in childbirth.

[*] There has been much common-place declamation againſt the cuſtom among the great, of not ſuckling their children. Nurſes were common in Rome, in the declenſion of the empire: hence we find Cornelia commended as a rare example of maternal virtue, as much for ſuckling her ſons, as for teaching them eloquence. That nurſes were common in Egypt, is probable from the contract which Pharaoh's daughter made with the unknown mother of Moſes, to allow her wages for ſuckling her own child. The ſame degrees of civilization require the ſame cuſtoms. A woman whoſe times for eating, ſleeping, &c. are conſtantly interrupted by the calls of enervating pleaſures, muſt always afford milk of an unwholeſome nature. It may truly be ſaid of a child doomed to live on this aliment, that as ſoon as it receives its

————" breath,
It ſucks in " the lurking principles of death."

caſes, the practice of thoſe phyſicians who conſult the appetite only, in diſeaſes which do not admit of a remedy.

The ſtate of a country in point of population, temperance, and induſtry, is ſo connected with its diſeaſes, that a tolerable idea may be formed of it, by looking over its bills of mortality. HOSPITALS, with all their boaſted advantages, exhibit at the ſame time monuments of the charity and depravity of a people *. The opulence of phyſicians, and the diviſions of their offices, into thoſe of ſurgery,

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* "Aurengezebe, emperor of Perſia, being aſked Why he did not build hoſpitals? ſaid, *I will make my empire ſo rich, that there ſhall be no need of hoſpitals.* He ought to have ſaid, I will begin by rendering my ſubjects rich, and then I will build hoſpitals.

"At Rome, the hoſpitals place every one at his eaſe, except thoſe who labour, thoſe who are induſtrious, thoſe who have lands, and thoſe who are engaged in trade.

"I have obſerved, that wealthy nations have need of hoſpitals, becauſe fortune ſubjects them to a thouſand accidents; but it is plain, that tranſient aſſiſtances are better than perpetual foundations. The evil is momentary; it is neceſſary, therefore, that the ſuccour ſhould be of the ſame nature, and that it be applied to particular accidents." Spirit of Laws, b. xxiii ch. 29.

pharmacy and midwifery, are likewiſe proofs of the declining ſtate of a country. In the infancy of the Roman empire, the prieſt performed the office of a phyſician; ſo ſimple were the principles and practice of phyſic. It was only in the declenſion of the empire that phyſicians vied with the emperors of Rome in magnificence and ſplendor*

I am ſorry to add in this place, that the number of patients in the HOSPITAL, and incurables in the

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It was reſerved for the preſent generation to ſubſtitute in the room of public hoſpitals private DISPENSARIES for the relief of the ſick. Philoſophy and chriſtianity alike concur in deriving praiſe and benefit from theſe excellent inſtitutions. They exhibit ſomething like an application of the mechanical powers to the purpoſes of benevolence; for in what other charitable inſtitutions do we perceive ſo great a *quantity* of diſtreſs relieved by ſo ſmall an expence?

* The firſt regular practitioners of phyſic in Rome, were women and ſlaves. The profeſſion was confined to them above ſix hundred years. The Romans during this period lived chiefly upon vegetables, particularly upon PULSE; and hence they were called, by their neighbours PULTIFAGI. They were likewiſe early inured to the healthy employments of war and huſbandry. Their diſeaſes, of courſe, were too few and ſimple to render the cure of them an object of a liberal profeſſion. When their diſeaſes became more numerous and compli-

ALMSHOUSE of this city, ſhow that we are treading in the enervated ſteps of our fellow ſubjects in Britain. Our bills of mortality likewiſe ſhow the encroachments of Britiſh diſeaſes upon us. The NERVOUS FEVER has become ſo familiar to us, that we look upon it as a natural diſeaſe. Dr Sydenham, ſo faithful in his hiſtory of fevers, takes no notice of it. Dr Cadwallader informed me, that it made its firſt appearance in this city about five and twenty years ago. It will be impoſſible to name the CONSUMPTION without recalling to our minds the memory of ſome friend or relation, who has periſhed within theſe few years by that diſorder. Its rapid progreſs among us has been unjuſtly attributed to the growing reſemblance of our climate to that of Great-Britain. The HYSTERIC and HYPOCHONDRIAC DISORDERS, once peculiar to the chambers of the great, are now to be found in our kitchens and workſhops. All

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complicated, their inveſtigation and cure required the aids of philoſophy. The profeſſion from this time became liberal; and maintained a rank with the other profeſſions which are founded upon the imperfection and depravity of human inſtitutions. Phyſicians are as neceſſary in the advanced ſtages of ſociety as ſurgeons, although their office is leſs ancient and certain. There are many artificial diſeaſes, in which they give certain relief; and even where their art fails, their preſcriptions are ſtill neceſſary, in order to ſmooth the avenues of death.

theſe diſeaſes have been produced by our having deſerted the ſimple diet, and manners, of our anceſtors.

The bleſſings of literature, commerce, and religion were not *originally* purchaſed at the expence of health. The complete enjoyment of health is as compatible with civilization, as the enjoyment of civil liberty. We read of countries, rich in every thing that can form national happineſs and national grandeur, the diſeaſes of which are nearly as few and ſimple as thoſe of the Indians. We hear of no diſeaſes among the Jews, while they were under their democratical form of government, except ſuch as were inflicted by a ſupernatural power*. We ſhould be tempted to doubt the the accounts given of the populouſneſs of that people, did we not ſee the practice of their ſimple cuſtoms producing nearly the ſame populouſneſs in Egypt, Rome, and other countries of antiquity. The Empire of China, it is ſaid contains more inhabitants than the whole of Europe. The political inſtitutions of that country have exempted its inhabitants from a large ſhare of the diſeaſes of other civilized nations. The inhabitants of Swiſſerland, Denmark, Norway* and Sweden, enjoy the chief advantages of civilization without having ſurrendered for them the bleſſings of natural health.

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* The principal employments of the Jews, like thoſe of the Romans in their ſimple ages, conſiſted in war and huſbandry. Their diet was plain, conſiſting chiefly of vegetables. Their only remedies were plaſters and ointments; which were calculated for thoſe diſeaſes which are produced by accidents.

accidents. In proportion as they receded from their ſimple cuſtoms, we find artificial diſeaſes prevail among them. The leproſy made its appearance in their journey through the wilderneſs. King Aſa's pains in his feet, were probably brought on by a fit of the gout. Saul and Nebuchadnezzar were afflicted with a melancholy. In the time of our Saviour, we find an account of all thoſe diſeaſes in Judea, which mark the declenſion of a people; ſuch as, the palſy, epilepſy, mania, blindneſs, hemorrhagia uterina, &c. It is unneceſſary to ſuppoſe, that they were let looſe at this juncture, on purpoſe to give our Saviour an opportunity of making them the chief ſubject of his miracles. They had been produced from natural cauſes, by the gradual depravity of their manners. It is remarkable, that our Saviour choſe thoſe artificial diſeaſes for the ſubject of his miracles, in preference to natural diſeaſes. The efforts of nature, and the operation of medicines, are too ſlow and uncertain in theſe caſes to detract in the leaſt from the validity of the miracle. He cured Peter's mother-in-law, it is true, of a fever; but to ſhew that the cure was miraculous, the ſacred hiſtorian adds, (contrary to what is common after a fever) "that ſhe aroſe *immediately* and miniſtered unto them."

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* In the city of Bergen, which conſiſts of 30,000 inhabitants, there is but one phyſician; who is ſupported at the expence of the public. Pontoppidan's Nat. Hiſt. of Norway.

But it is unneceſſary to appeal to ancient or remote nations to prove, that health is not incompatible with civilization. The inabitants of many parts of New England, particularly the province of Connecticut, are ſtrangers to artificial diſeaſes. Some of you may remember the time, and our fathers have told thoſe of us who do not, when the diſeaſes of PENNSYLVANIA were as few and as ſimple as thoſe of the Indians. The food of the inhabitants was then ſimple; their only drink was water; their appetites were reſtrained by labour; religion excluded the influence of ſickning paſſions; private hoſpitality ſupplied the want of a public hoſpital; nature was their only nurſe, temperance their principal phyſician. But I muſt not dwell upon this retroſpect of primæval manners; and I am too ſtrongly impreſſed with a hope of a revival of ſuch happy days, to pronounce them the golden age of our province.

Our eſteem for the cuſtoms of our ſavage neighbours will be leſſened, when we add, that civilization does not preclude the honours of old age. The proportion of old people is much greater among civilized, than among ſavage nations. It would be eaſy to decide this aſſertion in our favour, by appealing to facts in the natural hiſtories of Britain, Norway, Sweden, North-America*, and ſeveral of the Weſt-India Iſlands.

The laws of decency and nature, are not neceſſarily aboliſhed by the cuſtoms of civilized nations. In many of theſe, we read of women among whom nature alone ſtill performs the office of a midwife †, and who feel the obligations of ſuckling their children, to be equally binding with the common obligations of morality.

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* It has been urged againſt the ſtate of longevity in America, that the Europeans, who ſettle among us, generally arrive to a greater age than the Americans. This is not occaſioned ſo much by a peculiar firmneſs in their ſtamina, as by an increaſe of vigour, which the conſtitution acquires by a change of climate. A Frenchman (cæteris paribus) outlives an Engliſhman in England. An Hollander prolongs his life by removing to the Cape of Good Hope. A Portugueſe gains fifteen or twenty years by removing to Brazil. And there are good reaſons to believe, that a North-American would derive the ſame advantages, in point of health and longevity, by removing to Europe, which an European derives from coming to this country.

From a calculation made by an ingenious foreigner, it appears, that a greater proportion of old-people are to be found in Connecticut, than in any colony in North-America. This colony contains 180,000 inhabitants. They have no public hoſpitals or poor-houſes; nor is a beggar to be ſeen among them. There cannot be more ſtriking proofs than theſe facts of the ſimplicity of their manners.

† Parturition, in the ſimple ages of all countries, is performed by nature. The Iſraelitiſh women were delivered even

Civilization does not render us leſs fit for the neceſſary hardſhips of war. We read of armies of civilized nations, who have endured degrees of cold, hunger and fatigue, which have not been exceeded by the ſavages of any country *.

Civilization does not always multiply the avenues of death. It appears from the bills of mortality, of many countries, that fewer in proportion die among civilized, than among ſavage nations.

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even without the help of the Egyptian midwives. We read of but two women who died in child-birth in the whole hiſtory of the Jews. Dr Bancroft ſays, that child-bearing is attended with ſo little pain in Guiana, that the women ſeem to be exempted from the curſe inflicted upon Eve. Theſe eaſy births are not confined to warm climates. They are equally ſafe and eaſy in Norway and Iceland, according to Pontoppidan and Anderſon's hiſtories of thoſe countries.

* Civilized nations have, in the end, always conquered ſavages as much by their ability to bear hardſhips, as by their ſuperior military ſkill. Soldiers are not to be choſen indiſcriminately. The greateſt generals have looked upon ſound conſtitutions to be as eſſential to ſoldiers, as bravery or military diſcipline. Count Saxe refuſed ſoldiers born and bred in large cities; and ſought for ſuch only as were bred in mountainous countries. The King of Pruſſia calls young

ſoldiers

Even the charms of beauty are heightened by civilization. We read of ſtatelineſs, proportion, and fine teeth* and complexions in both ſexes, forming the principal outlines of national characters.

The danger of many diſeaſes, is not proportioned to their violence, but to their duration. America has advanced but a few paces in luxury and effeminacy. There is yet ſtrength enough in her vitals to give life to thoſe parts which are

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ſoldiers only to the dangers and honours of the field in his elegant poem, Sur l'Art de la Guerre, chant. 1. Old ſoldiers generally loſe the advantages of their veteraniſm, by their habits of idleneſs and debauchery. An able general, and experienced officers, will always ſupply the defects of age in young ſoldiers.

* Bad teeth are obſerved chiefly in middle latitudes, which are ſubject to alternate heats and colds. The inhabitants of Norway and Ruſſia are as remarkable for their fine teeth as the inhabitants of Africa. We obſerve fine teeth to be univerſal likewiſe among the inhabitants of France, who live in a *variable* climate. Theſe have been aſcribed to their protecting their heads from the action of the night air by means of woollen night-caps, and to the extraordinary attention to the teeth of their children. Theſe precautions ſecure good teeth; and are abſolutely neceſſary in all variable climates where people do not adopt all the cuſtoms of the ſavage life.

decayed. She may recall her ſteps. For this purpoſe,

I. Let our children be educated in a manner more agreeable to nature.

II. Let the common people (who conſtitute the wealth and ſtrength of our country) be preſerved from the effects of ſpirituous liquors. Had I a double portion of all that eloquence which has been employed in deſcribing the political evils that lately threatened our country, it would be too little to ſet forth the numerous and complicated *phyſical* and *moral* evils which theſe liquors have introduced among us. To encounter this *hydra* requires an arm accuſtomed like that of Hercules to vanquiſh monſters. Sir William Temple tells us, that in Spain no man can be admitted as an evidence in a court, who has once been convicted of drunkenneſs. I do not call for ſo ſevere a law in this country. Let us firſt try the force of ſevere manners. Lycurgus governed more by theſe, than by his laws. " Boni mores non bonæ leges," according to Tacitus, were the bulwarks of virtue among the ancient Germans.

III. I deſpair of being able to call the votaries of Bacchus from their bottle, and ſhall therefore leave them to be rouſed by the more eloquent twinges of the gout.

IV. Let us be cautious what kind of manufactures we admit among us. The rickets made their firſt appearance in the manufacturing towns in England. Dr Fothergill informed me, that he had often obſerved, when a pupil, that the greateſt part of the chronic patients in the London Hoſpital were Spittal-field weavers. I would not be underſtood, from theſe facts, to diſcourage thoſe manufacturers which employ women and children: theſe ſuffer few inconveniences from a ſedentary life: nor do I mean to offer the leaſt reſtraint to thoſe manufactories among men, which admit of free air, and the exerciſe of all their limbs. Perhaps a pure air and the abſtraction of ſpirituous liquors might render ſedentary employments leſs unhealthy in America, even among men, than in the populous towns of Great-Britain.

The population of a country is not to be accompliſhed by rewards and puniſhments. And it is happy for America, that the univerſal prevalence of the proteſtant religion, the checks lately given to negro ſlavery, the general unwillingneſs among us to acknowledge the uſurpations of primogeniture, the univerſal practice of inoculation for the ſmall-pox, and the abſence of the plague, render the interpoſition of government for that purpoſe unneceſſary.

Theſe advantages can only be ſecured to our country by AGRICULTURE. This is the true baſis of national health, riches and populouſneſs. Nations, like individuals, never riſe higher than when they are ignorant whither they are tending. It is impoſſible to tell from hiſtory, what will be the effects of agriculture, induſtry, temperance, and commerce, urged on by the competition of colonies, united in the ſame general purſuits, in a country, which for extent, variety of ſoil, climate, and number of navigable rivers, has never been equalled in any quarter of the globe. America is the theatre where human nature will probably receive her laſt and principal literary, moral and political honours.

But I recall myſelf from the ages of futurity. The province of Pennſylvania has already ſhewn to her ſiſter colonies, the influence of agriculture and commerce upon the number and happineſs of a people. It is ſcarcely an hundred years ſince our illuſtrious legiſlator, with an handful of men, landed upon theſe ſhores. Although the perfection of our government, the healthineſs of our climate, and the fertility of our ſoil, ſeemed to enſure a rapid ſettlement of the province; yet it would have required a preſcience bordering upon divine, to have foretold, that in ſuch a ſhort ſpace of time, the province would contain above 300,000 inhabitants; and that near 30,000 of this number ſhould compoſe a city, which ſhould be the third, if not the ſecond in commerce in the Britiſh empire. The purſuits of literature require leiſure and a total receſs from clearing foreſts, planting, building, and all the common toils of ſettling a new country: but before theſe arduous works were accompliſhed, the SCIENCES, ever fond of the company of liberty and induſtry, choſe this ſpot for the ſeat of their empire in this new world. Our COLLEGE, ſo catholic in its foundation, and extenſive in its objects, already ſees her ſons executing offices in the higheſt departments of ſociety. I have now the honour of ſpeaking in the preſence of a moſt reſpectable number of philoſophers, phyſicians, aſtronomers, botaniſts, patriots, and legiſlators; many of whom have already ſeized the prizes of honour, which their anceſtors had allotted to a much later poſterity. Our firſt offering had ſcarely found its way into the temple of fame, when the oldeſt ſocieties in Europe turned their eyes upon us, expecting with impatience to ſee the mighty fabric of ſcience, which like a well built arch, can only reſt upon the whole of its materials, completely finiſhed from the treaſures of this unexplored quarter of the globe.

It reflects equal honour upon our ſociety and the honourable aſſembly of our province, to acknowledge, that we have always found the latter willing to encourage by their patronage, and reward by their liberality, all our ſchemes for promoting uſeful knowledge. What may we not expect from this harmony between the ſciences and government! Methinks I ſee canals cut, rivers once impaſſible rendered navigable, bridges erected, and roads improved, to facilitate the exportation of grain. I ſee the banks of our rivers vying in fruitfulneſs with the banks of the river of Egypt. I behold our farmers, nobles; our merchants princes. But I forbear—Imagination cannot ſwell with the ſubject.

I beg leave to conclude, by deriving an argument from our connection with the legiſlature, to remind my auditors of the duty they owe to the ſociety. Patriotiſm and literature are here connected together; and a man cannot neglect the one without being deſtitute of the other. Nature and our anceſtors have completed their works among us; and have left us nothing to do, but to enlarge and perpetuate our own happineſs.

# AN ACCOUNT OF THE CLIMATE OF PENNSYLVANIA; AND ITS INFLUENCE UPON THE HUMAN BODY.

IN order to render the obſervations upon the epidemic diſeaſes which compoſe a part of this volume more uſeful, it will be neceſſary to prefix to them a ſhort account of the climate of Pennſylvania, and of its influence upon the human body. This account may perhaps ſerve further, to lead to future diſcoveries, and more extenſive obſervations, upon this ſubject.

The ſtate of Pennſylvania lies between 39° 43′ 25″, and 42° north latitude, including, of courſe, 2° 16′ 35″, equal to 157 miles from its ſouthern

to

to its northern boundary. The weſtern extremity of the ſtate is in the longitude of 5° 23′ 40″, and the eaſtern, is that of 27′ from the meridian of Philadelphia, comprehending in a due weſt courſe 311 miles, excluſive of the territory lately purchaſed by Pennſylvania from the United States, of which as yet no accurate ſurveys have been obtained. The ſtate is bounded on the ſouth by part of the ſtate of Delaware, by the whole ſtate of Maryland, and by Virginia to her weſtern extremity. The laſt named ſtate, the terrritory lately ceded to Connecticut, and Lake Erie, (part of which is included in Pennſylvania) form the weſtern and north-weſtern boundaries of the ſtate. Part of New-York and the territory lately ceded to Pennſylvania, with a part of Lake Erie, compoſe the northern, and another part of New-York, with a large extent of New-Jerſey (ſeparated from Pennſylvania by the river Delaware) compoſe the eaſtern boundaries of the ſtate. The lands which form theſe boundaries (except a part of the ſtates of Delaware, Maryland, and New-Jerſey) are in a ſtate of nature. A large tract of the weſtern and north-eaſtern parts of Pennſylvania are nearly in the ſame uncultivated ſituation.

The ſtate of Pennſylvania is interſected and diverſified with numerous rivers, and mountains. To deſcribe, or even to name them all, would far exceed the limits I have propoſed to this account of our climate. It will be ſufficient only to remark, that one of theſe rivers, viz. the Suſquehannah, begins at the northern boundary of the ſtate, twelve miles from the river Delaware, and winding ſeveral hundred miles through a variegated country, enters the ſtate of Maryland on the Southern line, fifty eight miles weſtward of Philadelphia; that each of theſe rivers is ſupplied by numerous ſtreams of various ſizes; that tides flow in parts of two of them, viz. in the Delaware and Schuylkill; that the reſt riſe and fall alternately in wet and dry weather; and that they deſcend with great rapidity, over prominent beds of rocks in many places, until they empty themſelves into the bays of Delaware and Cheſapeak on the eaſt, and into the Ohio on the weſtern part of the ſtate.

The mountains form a conſiderable part of the ſtate of Pennſylvania. Many of them appear to be reſerved as perpetual marks of the original empire of nature in this country. The Allegany, which croſſes the ſtate about two hundred miles from Philadelphia, in a north inclining to eaſt courſe, is the moſt conſiderable and extenſive of theſe mountains. It is called by the Indians the backbone of the continent. Its heighth in different places is ſuppoſed to be about 1300 feet from the adjacent plains.

The ſoil of Pennſylvania is diverſified by its vicinity to mountains and rivers. The vallies and bottoms conſiſt of a black mould, which extends from a foot to four feet in depth. But in general a deep clay forms the ſurface of the earth. Immenſe beds of limeſtone lie beneath this clay in many parts of the ſtate. This account of the ſoil of Pennſylvania is confined wholly to the lands on the eaſt ſide of the Allegany mountain. The ſoil on the weſt ſide of this mountain ſhall be deſcribed in another place.

The city of Philadelphia lies in the latitude of 39° 57′, in longitude 75° 8′ from Greenwich, and fifty five miles weſt from the Atlantic ocean.

It is ſituated about four miles due north from the conflux of the rivers Delaware and Schuylkill. The buildings which conſiſt chiefly of brick, extend nearly three miles north and ſouth along the Delaware, and above half a mile due weſt towards the Schuylkill, to which river the limits of the city extend; the whole of which include a diſtance of two miles from the Delaware. The land near the rivers, between the city and the conflux of the rivers, is in general low, moiſt and ſubject to be overflowed. The greateſt part of it is meadow ground. The land to the northward and weſtward, in the vicinity of the city, is high, and in general well cultivated. Before the year 1778 the ground between the preſent improvements of the city, and the river Schuylkill, was covered with woods. Theſe together with large tracts of wood to the northward of the city, were cut down during the winter the Britiſh army had poſſeſſion of Philadelphia. I ſhall hereafter mention the influence which the cutting down of theſe woods, and the ſubſequent cultivation of the grounds in the neighbourhood of the city, have had upon the health of its inhabitants.

The mean height of the ground on which the city ſtands, is about forty feet above the river Delaware. One of the longeſt and moſt populous ſtreets in the city, riſes only a few feet above the river. The air at the north is much purer than at the ſouth end of the city; hence the lamps exhibit a fainter flame in its ſouthern than its northern parts.

The tide of the Delaware ſeldom riſes more than ſix feet. It flows four miles in an hour. The width of the river near the city is about a mile.

The city with the adjoining diſtricts of Southwark and the Northern Liberties contain between 40 and 50,000 inhabitants.

From the accounts which have been handed down to us by our anceſtors, there is reaſon to believe that the climate of Pennſylvania has undergone a material change. Thunder and lightning are leſs frequent, and the cold of our winters and heat of our ſummers are leſs uniform, than they were forty or fifty years ago. Nor is this all. The ſprings are much colder, and the autumns more temperate than formerly, inſomuch that cattle are not houſed ſo ſoon by one month as they were in former years. Within the laſt eight years, there have been ſome exceptions to part of theſe obſervations. The winter of the year 1779, 80, was uniformly and uncommonly cold. The river Delaware was frozen near three months during this winter, and public roads for waggons and ſleighs connected the city of Philadelphia in many places with the Jerſey ſhore. The thickneſs of the ice in the river near the city, was from ſixteen to nineteen inches, and the depth of the froſt in the ground was from four to five feet, according to the expoſure of the ground and the quality of the ſoil. This extraordinary depth of the froſt in the earth, compared with its depth in more northern and colder countries, is occaſioned by the long delay of ſnow, which leaves the earth without a covering during the laſt autumnal and the firſt winter months. Many plants were deſtroyed by the intenſeneſs of the cold during this winter. The ears of horned cattle and the feet of hogs expoſed to the air, were froſt-bitten; ſquirrels periſhed in their holes, and patridges were often found dead in the neighbourhood of farm houſes. The mercury in January ſtood for ſeveral hours at 5° below 0, in Farenheit's thermometer; and during the whole of this month, (except on one day) it never roſe in the city of Philadelphia ſo high as to the freezing point.

The cold in the winter of the year 1783, 4, was as intenſe but not ſo ſteady, as it was in the winter that has been deſcribed. It differed from it materially in one particular, viz. there was a thaw in the month of January which opened all our rivers for a few days.

The ſummer which ſucceeded the winter of 1779, 80, was uniformly warm. The mercury in the thermometer, during this ſummer, ſtood on one day (the 15th of Auguſt) at 95°, and fluctuated between 93° and 80° for many weeks. The thermometer, in every reference that has been, or ſhall be made to it, ſtood in the ſhade in the open air.

I know it has been ſaid by many old people, that the winters in Pennſylvania are leſs cold, and the ſummers leſs warm, than they were forty or fifty years ago. The want of thermometrical obſervations before and during thoſe years, renders it difficult to decide this queſtion. Perhaps the difference of clothing and ſenſation between youth and old age, in winter and ſummer, may have laid the foundation of this opinion. I ſuſpect the mean temperature of the air in Pennſylvania has not altered, but that the principal change in our climate conſiſts in the heat and cold being leſs confined than formerly to their natural ſeaſons. I adopt the opinion of Doctor Williamſon * reſpecting the diminution of the cold in the ſouthern, being occaſioned by the cultivation of the northern parts of Europe; but no ſuch cultivation has taken place in the countries which lie to the north-weſt of Pennſylvania, nor do the partial and imperfect improvements which have been made in the north-weſt parts of the ſtate, appear to be ſufficient to leſſen the cold, even in the city of Philadelphia. I have been able to collect no facts, which diſpoſe

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* American Philoſophical Tranſactions, vol. I.

me to believe that the winters were colder before the year 1740, than they have been ſince. In the memorable winter of 1739, 40, the Delaware was croſſed on the ice in ſleighs on the 5th of March, old ſtyle, and did not open till the 13th of the ſame month. The ground was covered during this winter with a deep ſnow, and the rays of the ſun were conſtantly obſcured by a miſt, which hung in the upper regions of the air. In the winter of 1779, 80, the river was navigable on the 4th of March; the depth of the ſnow was moderate, and the gloomineſs of the cold was ſometime ſuſpended for a few days by a cheerful ſun. From theſe facts it is probable the winter of 1739, 40, was colder than the winter of 1779, 80.

Having premiſed theſe general remarks, I proceed to obſerve, that there are ſeldom more than twenty or thirty days in ſummmer or winter in Pennſylvania in which the mercury riſes above 80° in the former, or falls below 30° in the latter ſeaſon. Some old people have remarked that the number of *extremely* cold and warm days in ſucceſſive ſummers and winters, bears an exact proportion to each other. This was ſtrictly true in the years 1787 and 1788.

The warmeſt part of the day in ſummer is at two, in ordinary, and at three o'clock in the afternoon in extremely warm weather. From theſe hours the heat gradually diminiſhes till the enſuing morning. The cooleſt part of the four and twenty hours is at the break of day. There are ſeldom more than three or four nights in a ſummer in which the heat of the air is nearly the ſame as in the preceding day. After the warmeſt days, the evenings are generally agreeable, and often delightful. The higher the mercury riſes in the day time, the lower it falls the ſucceeding night. The mercury at 80° generally falls to 68°, while it deſcends, when at 60° only to 56°. This diſproportion between the temperature of the day and night, in ſummer is always greateſt in the month of Auguſt. The dews at this time are heavy in proportion to the coolneſs of the evening. They are ſometimes ſo conſiderable as to wet the clothes; and there are inſtances in which marſh-meadows, and even creeks, which have been dry during the ſummer, have been ſupplied with their uſual waters from no other ſource than the dews which have fallen in this month, or in the firſt weeks of September.

There is another circumſtance connected with the one juſt mentioned, which contributes very much to mitigate the heat of ſummer, and that is, it ſeldom continues more than two or three days without being ſucceeded with ſhowers of rain, accompanied ſometimes by thunder and lightning, and afterwards by a north-weſt wind, which produces a coolneſs in the air that is highly invigorating and agreeable.

The warmeſt weather is *generally* in the month of July. But intenſely warm days are often felt in May, June, Auguſt and September. In the annexed table of the weather for the year 1787, there is an exception to the firſt of theſe remarks. It ſhews that the mean heat of Auguſt was greater by a few degrees than that of July.

The tranſitions from heat to cold are often very ſudden, and ſometimes to very diſtant degrees. After a day in which the mercury has ſtood at 86° and even 90°, it ſometimes falls in the courſe of a ſingle night to the 65th, and even to the 60th degree, inſomuch that fires have been found neceſſary the enſuing morning, eſpecially if the change in the temperature of the air has been accompanied by rain and a ſouth-eaſt wind. In a ſummer month in the year 1775, the mercury was obſerved to fall 20° in an hour and an half. There are few ſummers in which fires are not agreeable during ſome parts of them. My ingenious friend Mr. David Rittenhouſe, whoſe talent for accurate obſervation extends alike to all ſubjects, informed me, that he had never paſſed a ſummer, during his reſidence in the country, without diſcovering froſt in every month of the year, except July.

The weather is equally variable in Pennſylvania during the greateſt part of the winter. The mercury fell from 37° to 4½° below 0, in four and twenty hours, between the fourth and fifth of February 1788. In this ſeaſon nature ſeems to play at croſs purpoſes. Heavy falls of ſnow are often ſucceeded in a few days by a general thaw, which frequently in a ſhort time leaves no veſtige of the ſnow. The rivers Delaware, Schuylkill and Suſquehannah have ſometimes been frozen (ſo as to bear horſes and carriages of all kinds) and thawed ſo as to be paſſable in boats, two or three times in the courſe of the ſame winter. The ice is formed for the moſt part in a gradual manner, and ſeldom till the water has been previouſly chilled by a fall of ſnow. Sometimes its production is more ſudden. On the night of the 31ſt of December 1764, the Delaware was completely frozen over between ten o'clock at night and eight the next morning, ſo as to bear the weight of a man. An unuſual vapour like a fog was ſeen to riſe from the water, in its paſſage from a fluid to a ſolid ſtate.

This account of the variableneſs of the weather in winter, does not apply to every part of Pennſylvania. There is a line about the 41° of the ſtate, beyond which the winters are ſteady and regular, inſomuch that the earth there is ſeldom without a covering of ſnow during the three winter months. In this line the climate of Pennſylvania forms a union with the climate of the eaſtern and northern ſtates.

The time in which froſt and ice begin to ſhew themſelves in the neighbourhood of Philadelphia, is generally about the latter end of October or the beginning of November. But the intenſe cold ſeldom ſets in till about the 20th or 25th of December; hence the common ſaying, "as the day lengthens the cold ſtrengthens." The coldeſt weather is commonly in January. The navigation of the river Delaware, after being frozen, is ſeldom practicable for large veſſels, before the firſt week in March.

As in ſummer there are often days in which fires are agreeable, ſo there are ſometimes days in winter in which they are diſagreeable. Vegetation has been obſerved in all the winter months. Garlic was taſted in butter in January 1781. The leaves of the willow, the bloſſoms of the peach tree, and the flowers of the dandelion and the crocus, were all ſeen in February 1779; and I well recollect, about thirty-two years ago, to have ſeen an apple-orchard in full bloom, and ſmall apples on many of the trees, in the month of December.

A cold day in winter is often ſucceeded by a moderate evening. The coldeſt part of the four and twenty hours is generally at the break of day.

In the moſt intenſe cold which has been recorded in Philadelphia, within the laſt twenty years, the mercury ſtood at 5° below 0. But it appears from the accounts publiſhed by Meſſieurs Maſon and Dixon, in the 58th volume of the Tranſactions of the Royal Society of London, that the mercury ſtood at 22° below 0 on the 2d of January 1767, at Brandywine, about thirty miles to the weſtward of Philadelphia. They inform us, that on the firſt of the ſame month the mercury ſtood at 20°, and on the day before at 7° below 0. I have to lament that I am not able to procure any record of the temperature of the air in the ſame year in Philadelphia. From the variety in the height and quality of the ſoil, and from the difference in the currents of winds and the quantity of rain and ſnow which fall in different parts of the ſtate, it is very probable this exceſſive cold may not have extended thirty miles from the place where it was firſt perceived.

The greateſt degree of heat upon record in Philadelphia, is 95°.

The ſtandard temperature of the air in the city of Philadelphia is 52½°, which is the temperature of our deepeſt wells, as alſo the mean heat of our common ſpring water.

The ſpring in Pennſylvania is generally leſs pleaſant than in many other countries. In March the weather is ſtormy, variable and cold. In April, and ſometimes in the beginning of May, it is moiſt, and accompanied by a degree of cold which has been called *rawneſs*, and which from its diſagreeable effects upon the temper has been called the *ſirocco* of this country. From the variable nature of the weather in the ſpring, vegetation advances very differently in different years. The colder the ſpring, the more favourable it proves to the fruits of the earth. The hopes of the farmer from his fruit-trees in a warm ſpring are often blaſted by a froſt in April and May. A fall of ſnow is remembered with regret by many of them on the night between the third and fourth of May in the year 1774. The colder the winter, the greater delay we obſerve in the return of the enſuing ſpring.

Sometimes the weather during the ſpring months is cloudy and damp, attended occaſionally with a gentle fall of rain reſembling the ſpray from a cataract of water. A day of this ſpecies of weather is called, from its reſemblance to a damp day in Great-Britain, "an Engliſh day." This damp weather ſeldom continues more than three or four days. The month of May 1786, will long be remembered, for having furniſhed a very uncommon inſtance of the abſence of the ſun for fourteen days, and of conſtant damp or rainy weather.

The month of June is the only month in the year which reſembles a ſpring month in the ſouthern countries of Europe. The weather is then generally temperate, the ſky is ſerene, and the verdure of the country is univerſal and delightful.

The autumn is the moſt agreeable ſeaſon in the year in Pennſylvania. The cool evenings and mornings, which generally begin about the firſt week in September, are ſucceeded by a moderate temperature of the air during the day. This ſpecies of weather continues with an increaſe of cold ſcarcely perceptible, till the middle of October, when the autumn is cloſed by rain, which ſometimes falls in ſuch quantities as to produce deſtructive freſhes in the rivers and creeks, and ſometimes deſcends in gentle ſhowers, which continue with occaſional interruptions by a few fair days, for two or three weeks. Theſe rains are the harbingers of the winter; and the Indians have long ago taught the inhabitants of Pennſylvania, that the degrees of cold during the winter, are in proportion to the quantity of rain which falls during the autumn*.

From this account of the temperature of the air in Pennſylvania, it is evident that there are ſeldom more than four months in which the weather is agreeable without a fire.

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* I cannot help agreeing with Mr Kirwan, in one of his remarks upon the ſcience of meteorology in the preface to his eſtimate of the temperature of different latitudes. "This "ſcience (ſays he) if brought to perfection would enable "us at leaſt to foreſee thoſe changes in the weather which we "could not prevent. Great as is the diſtance between ſuch "knowledge, and our own preſent attainments, we have no "reaſon to think it above the level of the powers of the "human mind. The motions of the planets muſt have ap"peared as perplexed and intricate to thoſe who firſt con"templated them; yet by perſevering induſtry, they are now "known to the utmoſt preciſion. The preſent is (as the "great Leibnitz expreſſes it) in every caſe pregnant with "the

In winter the winds generally come from the north-weſt in *fair*, and from the north-eaſt in *wet* weather. The north-weſt winds are uncommonly dry as well as cold. It is in conſequence of the violent action of theſe winds that trees have uniformly a thicker and more compact bark on their northern than on their ſouthern expoſures. Even brick houſes are affected by the force and dryneſs of theſe north-weſt winds: hence it is much more difficult to demoliſh the northern than the ſouthern walls of an old brick houſe. This fact was communicated to me by an eminent bricklayer in the city of Philadelphia.

The winds in fair weather in the ſpring, and in warm weather in the ſummer, blow from the ſouth-weſt and from weſt-north-weſt. The *raw* air before mentioned comes from the north-eaſt. The ſouth-weſt winds likewiſe uſually bring with them thoſe ſhowers of rain in the ſpring and ſum-

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" the future, and the connection muſt be found by long and " attentive obſervation."

The influence which the perfection of this ſcience muſt have upon health, agriculture, navigation and commerce, is too obvious to be mentioned.

mer which refreſh the earth. They moreover moderate the heat of the weather, provided they are ſucceeded by a north-weſt wind. Now and then ſhowers of rain come from the weſt-north-weſt.

There is a common fact connected with the account of the uſual winds in Pennſylvania, which it may not be improper to mention in this place. While the clouds are ſeen flying from the ſouth-weſt, the *ſcud*, as it is called, or a light vapour, is ſeen at the ſame time flying below the clouds from the north-eaſt.

The moiſture of the air is much greater than formerly, occaſioned probably by the exhalations which in former years fell in the form of ſnow, now deſcending in the form of rain. The depth of the ſnow is ſometimes between two and three feet, but in general ſeldom exceeds between ſix and nine inches.

Hail frequently deſcends with ſnow in winter. Once in four or five years large and heavy ſhowers of hail fall in the ſpring and ſummer. They generally run in narrow veins (as they are called) of thirty or forty miles in length, and two or three miles in breadth. The heavieſt ſhower of hail that is remembered in Philadelphia, did not extend in breadth more than half a mile north and ſouth. Some of the ſtones weighed half an ounce. The windows of many houſes were broken by them. This ſhower fell in May 1783.

From ſudden changes in the air, rain and ſnow often fall together, forming what is commonly called *ſleet*.

In the uncultivated parts of the ſtate, the ſnow ſometimes lies on the ground till the firſt week in April. The backwardneſs of the ſpring has been aſcribed to the paſſage of the air over the undiſſolved beds of ſnow and ice which uſually remain, after the winter months are paſt, on the north-weſt grounds and waters of the ſtate, and of the adjacent country.

The diſſolution of the ice and ſnow in the ſpring is ſometimes ſo ſudden as to ſwell the creeks and rivers in every part of the ſtate to ſuch a degree, as not only to lay waſte the hopes of the huſbandman from the produce of his lands, but in ſome inſtances to ſweep his barns, ſtables, and even his dwelling houſe into their currents*. The wind during a general thaw, comes from the ſouth-weſt or ſouth-eaſt.

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* The following account of the thaw of the river Suſquehannah, in the ſpring of 1784, was publiſhed by the author in the Columbian Magazine for November 1786. It may ſerve to

to illuſtrate a fact related formerly in the Hiſtory of the winters in Pennſylvania, as well as to exhibit an extraordinary inſtance of the deſtructive effects of a ſudden thaw.

"The winter of 1783-4, was uncommonly cold, inſomuch that the mercury in Farenheit's thermometer ſtood ſeveral times at 5 degrees below 0. The ſnows were frequent; and, in many places, from two to three feet deep, during the greateſt part of the winter. All the rivers in Pennſylvania were frozen, ſo as to bear waggons and ſleds with immenſe weights. In the month of January a thaw came on ſuddenly, which opened our rivers ſo as to ſet the ice a-driving, to uſe the phraſe of the country. In the courſe of one night, during the thaw, the wind ſhifted ſuddenly to the north-weſt, and the weather became intenſely cold. The ice which had floated the day before, was ſuddenly obſtructed; and in the river Suſquehannah, the obſtructions were formed in thoſe places where the water was moſt ſhallow, or where it had been accuſtomed to fall. This river is ſeveral hundred miles in length, and from half a mile to a mile and an half in breadth, and winds through a hilly, and in many places a fertile and highly cultivated country. It has as yet a moſt difficult communication with our bays and the ſea, occaſioned by the number and height of the falls which occur near the mouth of the river. The ice in many places, eſpecially where there were falls, formed a kind of dam, of a moſt ſtupendous height. About the middle of March our weather moderated, and a thaw became general. The effects of it were remarkable in all our rivers; but in none ſo much as in the river I have mentioned. I ſhall therefore endeavour in a few words to deſcribe them. Unfortunately the dams of ice did not give way all

The air, when dry in Pennſylvania, has a peculiar elaſticity, which renders the heat and cold leſs inſupportable than the ſame degrees of both are in moiſter countries. It is in thoſe caſes only when ſummer ſhowers are not ſucceeded by north-weſt winds, that the heat of the air becomes oppreſſive and diſtreſſing, from being combined with moiſture.

all at once, nor thoſe which lay neareſt to the mouth of the river, firſt. While the upper dams were ſet a-float by the warm weather, the lower ones, which were the largeſt, and in which, of courſe, the ice was moſt impacted, remained fixed. In conſequence of this, the river roſe in a few hours, in many places, above 30 feet; rolling upon its ſurface large lumps of ice from 10 to 40 cubic feet in ſize. The effects of this ſudden inundation were terrible. Whole farms were laid under water. Barns—ſtables—horſes—cattle—fences—mills of every kind, and in one inſtance, a large ſtone houſe, 40 by 30 feet, were carried down the ſtream. Large trees were torn up by the roots—ſeveral ſmall iſlands covered with woods, were ſwept away, and not a veſtige of them was left behind. On the barns which preſerved their ſhape, in ſome inſtances, for many miles were to be ſeen living fowls; and, in one dwelling, a candle was ſeen to burn for ſome time, after it was ſwept from its foundation. Where the ſhore was level, the lumps of ice, and the ruins of houſes and farms, were thrown a quarter of a mile from the ordinary height of the river. In ſome inſtances, farms were ruined by the mould being ſwept from them by the cakes of ice, or by depoſitions of ſand; while others were enriched by large depoſitions of mud. The damage, upon the whole, done to the ſtate of

Pennſylvania

From tradition, as well as living obſervation, it is evident, that the waters in many of the creeks in Pennſylvania have diminiſhed conſiderably within the laſt fifty years. Hence many mills, erected upon large and deep ſtreams of water, now ſtand idle in dry weather; and many creeks, once navigable in large boats, are now impaſſable even in canoes. This diminution of the waters has been aſcribed to the application of a part of them to the purpoſe of making meadows.

The mean elevation of the barometer in Philadelphia, is about 30 inches. The variations in the barometer are very inconſiderable in the greateſt changes of the weather, which occur in the city of Philadelphia. During the violent and deſtructive ſtorm which blew from the ſouth-weſt on the 11th of November 1788, it ſuddenly fell from 30 to $29\frac{3}{10}$. Mr. Rittenhouſe informs me, that long and faithful obſervations have ſatisfied him,

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Pennſylvania by this freſh, was very great. In moſt places it happened in the day time, or the conſequences muſt have been fatal to many thouſands.

"I know of but one uſe that can be derived from recording the hiſtory of this inundation. In caſe of ſimilar obſtructions of rivers, from cauſes ſuch as have been deſcribed, the terrible effects of their being ſet in motion by means of a general thaw may in part be obviated, by removing ſuch things out of the courſe of the water and ice as are within that the alterations in the height of the mercury in the barometer do not *precede* but always *ſucceed* changes in the weather. It falls with the ſouth and ſouth-weſt, and riſes with the north and north-weſt winds.

The quantity of water which falls in rain and ſnow, one year with another, amounts to from 24 to 36 inches. But to complete the account of variable qualities in the climate, it will be neceſſary to add, that our ſummers and autumns are ſometimes marked by a *deficiency*, and ſometimes by an *exceſſive* quantity of rain. The ſummer and autumn of 1782 were uncommonly dry. Near two months elapſed without a ſingle ſhower of rain. There were only two ſhowers in the whole months of September and October. In conſequence of this dry weather, there was no ſecond crop of hay. The Indian corn failed of its increaſe in many places, and was cut down for food for cattle. Trees newly planted, died. The paſture fields not only loſt their verdure, but threw up ſmall clouds of duſt when agitated by the feet of men, or beaſts. Cattle in ſome inſtances were driven many miles to be watered, every morning

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our power; particularly cattle, hay, grain, fences, and farming utenſils of all kinds."

and evening*. The earth became ſo inflammable in ſome places, as to burn above a foot below its ſurface. A complete conſumption of the turf by an accidental fire kindled in the adjoining ſtate of New-Jerſey, ſpread terror and diſtreſs through a large tract of country. Springs of water and large creeks were dried up in many parts of the ſtate. Rocks appeared in the river Schuylkill which had never been obſerved before, by the oldeſt perſons then alive. On one of them were cut the figures 1701. The atmoſphere, during part of this dry weather, was often filled, eſpecially in the mornings, with a thin miſt†, which while it deceived with the expectation of rain, ſerved the valuable purpoſe of abating the heat of the ſun. I am ſorry that I am not able to furniſh the mean heat of each of the ſummer months. My notes of the weather enable me to add nothing further upon this ſubject, than that the ſummer was "uncommonly cool."

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[*] It was remarked during this dry weather, that the ſheep were uncommonly fat, and their fleſh well taſted, while all the other domeſtic animals languiſhed from the want of graſs and water.

[†] A ſimilar miſt was obſerved in France by Dr Franklin, in the ſummer of 1782. The winter which ſucceeded it was uncommonly cold in France, as well as in Pennſylvania.

The ſummer of the year 1788 afforded a remarkable inſtance of *exceſs* in the quantity of rain which ſometimes falls in Pennſylvania. Thirteen days are marked with rain in July in the records of the weather kept at Spring-Mill. There fell on the 18th and 19th of Auguſt ſeven inches of rain in the city of Philadelphia. The wheat ſuffered greatly by the conſtant rains of July in the eaſtern and middle parts of the ſtate. So unproductive a harveſt in grain, from wet weather, had not been known, it is ſaid, in the courſe of the laſt 70 years. The heat of the air during theſe ſummer months was very moderate. Its mean temperature at Spring-Mill was 67,8 in June, 74,7 in July, and only 70,6 in Auguſt.

It is ſome conſolation to a citizen of Pennſylvania, in recording facts which ſeem to militate againſt our climate, to reflect that the difference of the weather in different parts of the ſtate at the ſame ſeaſon, is happily accommodated to promote an increaſe of the ſame objects of agriculture; and hence a deficiency of crops has never been known in any one year throughout the *whole* ſtate.

The aurora borealis and meteors are ſeen occaſionally in Pennſylvania. In the preſent imperfect ſtate of our knowledge of their influence upon the human body, it will be foreign to the deſign of this hiſtory of our climate to deſcribe them.

Storms and hurricanes are not unknown in Pennſylvania. They occur once in four or five years, but they are moſt frequent and deſtructive in the autumn. They are generally accompanied by rain. Trees are torn up by the roots, and the rivers and creeks are ſometimes ſwelled ſo ſuddenly as to do conſiderable damage to the adjoining farms. The wind, during theſe ſtorms, generally blows from the ſouth-eaſt and ſouth-weſt. In the ſtorms which occurred in September 1769, and in the ſame month of the year 1785, the wind veered round contrary to its uſual courſe, and blew from the north.

After what has been ſaid, the character of the climate of Pennſylvania may be ſummed up in a few words. There are no two ſucceſſive years alike. Even the ſame ſucceſſive ſeaſons and months differ from each other every year. Perhaps there is but one ſteady trait in the character of our climate, and that is, it is uniformly variable.

To furniſh the reader with a ſuccinct view of the weather in Pennſylvania, that includes all the articles that have been mentioned, I ſhall here ſubjoin a table containing the reſult of meteorological obſervations made near the river Schuylkill, for one year, in the neighbourhood of Philadelphia, by an ingenious French gentleman*, who divides his time between rural employments and uſeful philoſophical purſuits. This table is extracted from the Columbian magazine for February 1788. The height of Spring-Mill above the city of Philadelphia, is ſuppoſed to be about 70 feet

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* Mr. Legeaux.

## METEOROLOGICAL OBSERVATIONS, made at SPRING-MILL, 13 Miles NNW of Philadelphia. Reſult of the Year 1787.

| MONTH. | THERMOMETER. of *Farenheit*, mean degree D. | $\frac{1}{10}$ | 0 | THERMOMETER. de *Reaumur*, degres moyens D. | $\frac{1}{10}$ | 0 | BAROMETER. mean height. in. | pts. | $\frac{1}{10}$ | PREVAILING WIND. | DAYS. of aur. bor. | of rain. | of thunder. | of ſnow. | of tempeſt. | WATER of RAIN and SNOW, in. | pts. | $\frac{1}{10}$ | WEATHER. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| January | 35 | 1 | | 1 | 4 | | 29 | 9 | 9 | Variable ſtill | | 7 | 1 | 4 | | 3 | 10 | 10 | Fair, ſtill, cold, and ſnow. |
| February | 33 | 8 | | | 8 | | 29 | 9 | 9 | NE | | 3 | | 3 | 2 | 3 | 7 | 3 | Fair, overcaſt. |
| March | 45 | 1 | | 5 | 8 | | 29 | 9 | 7 | W | | 6 | | 3 | | 2 | 4 | 2 | Fair, windy. |
| April | 54 | 3 | | 9 | 9 | | 29 | 9 | 6 | Still, SW | | 3 | 2 | 1 | 2 | 1 | 2 | 13 | Fair, and very dry. |
| May | 61 | 2 | | 13 | | | 29 | 9 | 2 | Still, WSW | 1 | 14 | 6 | | 2 | 4 | 11 | 4 | Foggy, cold, and wet. |
| June | 70 | 7 | | 17 | 2 | | 29 | 8 | 2 | WNW | | 9 | 1 | | | 1 | 10 | 4 | Very fair and growing weather. |
| July | 72 | 2 | | 17 | 9 | | 29 | 9 | 10 | WW,SW vari. | 1 | 5 | 2 | | | 3 | 1 | 11 | Fair, and overcaſt. |
| Auguſt | 74 | 5 | | 18 | 9 | | 29 | 10 | 6 | W | | 11 | 4 | | 1 | 5 | 2 | 3 | Very fair, and cloudy. |
| September | 64 | 7 | | 14 | 5 | | 29 | 10 | 4 | WNW | | 6 | 1 | | 1 | 2 | 7 | 8 | Fair weather. |
| October | 51 | 1 | | 8 | 5 | | 29 | 11 | 9 | WNW variab. | 1 | 4 | | | | | 7 | 10 | Foggy, fair, and dry weather. |
| November | 45 | 1 | | 5 | 8 | | 29 | 11 | 1 | Still, variable. | 1 | 5 | | | | 2 | 6 | 10 | Very fair. |
| December | 34 | | | | 9 | | 29 | 7 | 7 | WNW | | | | 1 | 1 | | 9 | | Very fair, and very dry. |
| RESULT. | 10Feb greateſt D. of cold.<br>5 | | | 10 Feb. D. du plus gr. froid.<br>12 | | 0 | 8 Mar. greateſt elevation.<br>30 | 10 | | WNW | 4 | 73 | 17 | 12 | 9 | 32 | 8 | 14 | TEMPERATURE OF THE YEAR 1787.<br>Very fair, dry, abundant in every thing, and healthy. |
| | 3 July, greateſt D. of heat.<br>96 | 1 | | 3 July pluŝ G. D. de chaud.<br>28 | 5 | | 2 Febr. leaſt elevation.<br>29 | | | | | | | | | | | | |
| | Variation.<br>91 | 1 | | Variation.<br>40 | 5 | | Variation.<br>1 | 10 | | | | | | | | | | | |
| | Temperature.<br>53 | 5 | | Temperature.<br>9 | 6 | | Mean elevat.<br>29 | 9 | 9 | | | | | | | | | | |

It is worthy of notice, how near the mean heat of the year, and of the month of April, in two ſucceſſive years, are to each other in the ſame place. The mean heat of April 1787 was 54°3, that of April 1788 was 52°2. By the table of the mean heat of each month in the year, it appears that the mean heat of 1787 was 53°5 at Spring-Mill.

The following accounts of the climates of Pekin and Madrid, which lie within a few minutes of the ſame latitude as Philadelphia, may ſerve to ſhew how much climates are altered by local and relative circumſtances. The account of the temperature of the air at Pekin will ſerve further to ſhew, that with all the advantages of the higheſt degrees of cultivation which have taken place in China, the winters are colder, and the ſummers warmer there than in Pennſylvania, principally from a cauſe which will probably operate upon the winters of Pennſylvania for many centuries to come, viz. the vicinity of an uncultivated north-weſt country.

" Pekin, lat. 39°54′, long. 116°29′ W.

" By five years obſervations its annual mean temperature was found to be 55°5′.

| | | | |
|---|---|---|---|
| January - - | 20°,75 | July - - | 84°,8 |
| February - | 32 | Auguſt - | 83 |
| March - - | 48 | September - | 63 |
| April - - | 59 | October - - | 52 |
| May - - | 72 | November - | 41 |
| June - - | 83,75 | December - | 27 |

“ The temperature of the Atlantic under this parallel is 62, but the ſtandard of this part of the globe is the North Pacific, which is here 4 or 5 degrees colder than the Atlantic. The Yellow Sea is the neareſt to Pekin, being about 200 miles diſtant from it; but it is itſelf cooled by the mountainous country of Corea, which interpoſes between it and the ocean, for a conſiderable part of its extent. Beſides, all the northern parts of China (in which Pekin lies) muſt be cooled by the vicinity of the mountains of Chineſe Tartary, among which the cold is ſaid to be exceſſive.

“ The greateſt cold uſually experienced during this period, was 5°, the greateſt heat, 98°: on the 25th of July 1773, the heat aroſe to 108° and 110°; a N. E. or N. W. wind produces the greateſt cold, a S. or S. W. or S. E. the greateſt heat*.”

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* “ 6 Mem. Scav. Etrang. p. 528.”

"MADRID, lat. 40° 25′ long. 3° 20′ E.

"The uſual heat in ſummer is ſaid to be from 75 to 85°; even at night it ſeldom falls below 70°; the mean height of the barometer is 27,96. It ſeems to be about 1900 feet above the level of the ſea*."

The above accounts are extracted from Mr. Kirwan's uſeful and elaborate eſtimate of the temperature of different latitudes.

The hiſtory which has been given of the climate of Pennſylvania, is confined chiefly to the country on the eaſt ſide of the Allegany mountain. On the weſt ſide of this mountain, the climate differs materially from that of the ſouth-eaſtern parts of the ſtate in the temperature of the air, in the effects of the winds upon the weather, and in the quantity of rain and ſnow, which falls every year. The winter ſeldom breaks up on the mountains before the 25th of March. A fall of ſnow was once perceived upon it, which meaſured an inch and an half on the 11th day of June. The trees which grow upon it are ſmall, and Indian corn is with difficulty brought to maturity even at the foot of the eaſt ſide of it. The ſouth-weſt winds on the weſt ſide of the mountain are accompanied by cold and rain. The ſoil is rich, conſiſting of near a foot in many places of black mould. The roads in this country are muddy in winter, but ſeldom duſty in ſummer. The arrangement of ſtrata of the earth on the weſt ſide, differs materially from their arrangement on the eaſt ſide the mountain. "The country, (ſays "Mr. Rittenhouſe in a letter to a friend in Philadelphia*) when viewed from the weſtern "ridge of the Allegany appears to be one vaſt, "extended plain. All the various ſtrata of "ſtone ſeem to lie undiſturbed in the ſituation "in which they were firſt formed, and the layers of ſtone, ſand, clay, and coal, are nearly "*horizontal.*"

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* "Mem. Par. 1777, p. 146."

The temperature of the air on the weſt is ſeldom ſo hot, or ſo cold, as on the eaſt ſide of the mountain. By comparing the ſtate of a thermometer examined by Dr. Bedford at Pittſburg, 284 miles from Philadelphia, it appears that the weather was not ſo cold by twelve degrees in that town, as it was in Philadelphia, on the 5th of February 1788.

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* Columbian Magazine for October 1786.

To ſhew the difference between the weather at Spring-Mill and in Pittſburg, I ſhall here ſubjoin an account of it, in both places, the firſt taken by Mr. Legeaux, and the other by Doctor Bedford.

METEOROLOGICAL OBSERVATIONS, made at SPRING-MILL, 13 Miles NNW of Philadelphia. Month of April, 1788.

| D. of the month. | THERMOMETER. of *Farenheit*, mean degree D. | $\frac{1}{10}$ | O | de *Reaumur*, degrés moyens D. | $\frac{1}{10}$ | O. | BAROMETER. mean height in. | pts. | $\frac{1}{10}$ | PREVAILING WIND. | DAYS of aur. boreal. | of rain. | of thunder. | of ſnow. | of tempeſt. | WATER. of RAIN and SNOW, in. | pts. | $\frac{1}{10}$ | WEATHER. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 58 | 1 | | 11 | 6 | | 29 | 10 | 5 | W | | | | | | | | | Overcaſt, fair. |
| 2 | 46 | 9 | | 6 | 9 | | 30 | 1 | | Calm. | | | | | | | | | Overcaſt and windy. |
| 3 | 40 | 3 | | 3 | 7 | | 30 | | 3 | Changeable. | | 1 | | | | | 1 | 15 | Overcaſt, rainy. |
| 4 | 51 | 3 | | 8 | 6 | | 29 | 11 | 7 | SW | | | | | | | | | Overcaſt. |
| 5 | 51 | 1 | | 8 | 5 | | 30 | | 7 | E | | | | | | | | | Overcaſt, fair, |
| 6 | 55 | 7 | | 10 | 5 | | 29 | 11 | 7 | Calm. | | 1 | | | | | 1 | 3 | Overcaſt, rainy. |
| 7 | 51 | 3 | | 8 | 6 | | 30 | 2 | | NE | | 1 | | | | | 2 | 7 | Overcaſt, rainy. |
| 8 | 42 | 1 | | 4 | 5 | | 29 | 11 | | E | | 1 | | | | | 1 | 4 | Rainy. |
| 9 | 63 | 5 | | 14 | | | 29 | 8 | | W | | | | | | | | | Overcaſt, windy, |
| 10 | 46 | 7 | | 6 | 5 | | 29 | 10 | | W | | | | | | | | | Fair. |
| 11 | 53 | 8 | | 9 | 7 | | 30 | 2 | | W | | | | | | | | | Very fair. |
| 12 | 44 | 5 | | 5 | 5 | | 29 | 10 | | Calm. | | 1 | | | | | 1 | 11 | Overcaſt, rainy, |
| 13 | 60 | 5 | | 12 | 7 | | 29 | 10 | 3 | SW | | | | | | | | | Very fair. |
| 14 | 50 | 2 | | 8 | 1 | | 29 | 9 | | E | | 1 | | | | | 1 | 14 | Fair, overcaſt, rainy, |
| 15 | 58 | 1 | | 11 | 6 | | 29 | 9 | 7 | SW | | 1 | | | | | 2 | 13 | Foggy, rainy. |
| METEOROLOGICAL OBSERVATIONS, made at PITTSBURG, 284 Miles Weſt of Philadelphia. Month of April, 1788. | | | | | | | | | | | | | | | | | | | |
| 1 | 46 | | | | | | | | | SW | | 1 | | | | | | | Cloudy. |
| 2 | 42 | | | | | | | | | NE b N | | | | | | | | | Clear. |
| 3 | 43 | | | | | | | | | SE | | 1 | | | | | | | Cloudy, |
| 4 | 64 | | | | | | | | | Calm. | | | | | | | | | Clear. |
| 5 | 80 | | | | | | | | | SE b S | | 1 | 1 | | | | | | Cloudy. |
| 3 | 52 | | | | | | | | | SW | | 1 | | | | | | | Cloudy. |
| 7 | 48 | | | | | | | | | NE b N | | | | | | | | | Cloudy. |
| 8 | 66 | | | | | | | | | SE b S | | 1 | 1 | | | | | | Cloudy. |
| 9 | 56 | | | | | | | | | NW b N | | | | | | | | | Cloudy. |
| 10 | 60 | | | | | | | | | SW | | | | | | | | | Cloudy, with wind. |
| 11 | 62 | | | | | | | | | Calm | | | | | | | | | Clear. |
| 12 | 67 | | | | | | | | | SW | | | | | | | | | Cloudy, with wind. |
| 13 | 62 | | | | | | | | | Calm. | | | | | | | | | Clear. |
| 14 | 60 | | | | | | | | | Variable. | | 1 | | | | | | | Cloudy. |
| 15 | 52 | | | | | | | | | W | | | | | | | | | Cloudy. |

From a review of all the facts which have been mentioned, it appears that the climate of Pennſylvania is a compound of moſt of the climates in the world. Here we have the moiſture of Britain in the ſpring, the heat of Africa in ſummer, the temperature of Italy in June, the ſky of Egypt in the autumn, the cold and ſnows of Norway and the ice of Holland in the winter, the tempeſts (in a certain degree) of the Weſt-Indies in every ſeaſon, and the variable winds and weather of Great-Britain in every month of the year.

From this hiſtory of the climate of Pennſylvania, it is eaſy to aſcertain what degrees of health, and what diſeaſes prevail in the ſtate. As we have the climates, ſo we have the health, and the acute diſeaſes, of all the countries that have been mentioned. Without attempting to enumerate the diſeaſes, I ſhall only add a few words upon the *time* and *manner* in which they are produced.

I. It appears from the teſtimonies of many aged perſons, that pleuriſies and inflammatory diſorders of all kinds, are leſs frequent now than they were forty or fifty years ago.

II. It is a well known fact, that intermitting and bilious fevers have increaſed in Pennſylvania in proportion as the country has been *cleared of its wood,* in many parts of the ſtate.

III. It is equally certain that theſe fevers have leſſened, or diſappeared, in proportion as the country has been *cultivated.*

IV. Heavy rains and freſhes in the ſpring ſeldom produce fevers, unleſs they are ſucceeded by unſeaſonably warm weather.

V. Heavy rains or froſt, in the autumn, alike check the progreſs of bilious fevers in Pennſylvania.

VI. The ſame ſtate of the atmoſphere, whether cold or warm, moiſt or dry, continued for a long time without any material changes, is always healthy. Acute and inflammatory fevers were in vain looked for in the cold winter of 1779-80. The dry ſummer of 1782, and the wet ſummer of 1788, were likewiſe uncommonly healthy in the city of Philadelphia. Theſe facts extend only to thoſe diſeaſes which depend upon the ſenſible qualities of the air. Diſeaſes from miaſmata and contagion, are leſs influenced by the uniformity of the weather. The autumn of 1780 was very ſickly in Philadelphia, from the peculiar ſituation of the grounds in the neighbourhood of the city, while the country was uncommonly healthy. The dry ſummer and autumn of 1782 were uncommonly ſickly in the country, from the extenſive ſources of morbid exhalations which were left by the diminution of the waters in the creeks and rivers. The city of Philadelphia owed its peculiar healthineſs during theſe two ſeaſons, to its being nearly ſurrounded by tide water.

VII. Diſeaſes are often *generated* in one ſeaſon and *produced* in another. Hence we frequently obſerve fevers of different kinds to *follow* every ſpecies of the weather that was mentioned in the laſt obſervation.

VIII. The fevers which accompany, or follow a warm ſummer, are bilious and remitting. In proportion as the cool weather advances, they put on the type of Doctor Cullen's typhus mitior. After a very cold winter, I have twice ſeen pleuriſies in the ſpring, accompanied by the ſymptoms of the bilious fever. In one of thoſe epidemics, the pulſe, on the fifth day, in ſeveral caſes, became irregular, and ſtopped after every third or fourth ſtroke. This complication of typhus with pneumonia, is not peculiar to Pennſylvania. I have been informed that fevers of even a putrid kind frequently ſucceed long and cold winters in Ruſſia and Sweden. They have been aſcribed, by a Ruſſian phyſician, to extreme cold producing the ſame ſedative effects as extreme heat, upon the human body.

IX. The exceſſive heat in Pennſylvania has ſometimes proved fatal to perſons who have been much expoſed to it. Its morbid effects diſcover themſelves by a difficulty of breathing, a general langour, and in ſome inſtances, by a numbneſs and an immobility of the extremities. The exceſſive cold in Pennſylvania has more frequently proved fatal, but it has been chiefly to thoſe perſons who have ſought a defence from it, by large draughts of ſpirituous liquors. Its operation in bringing on ſleepineſs previous to death, is well known. On the 5th of February 1788, many people were affected by the cold. It produced a violent pain in the head; and in one inſtance, a ſickneſs at the ſtomach, and a vomiting appeared to be the conſequence of it. I have frequently obſerved that a greater number of old people die, during the continuance of extreme cold, and warm weather, than in the ſame number of days, in moderate weather.

X. May and June are uſually the healthieſt months in the year.

XI. The influence of the winds upon health, depends very much upon the nature of the country over which they paſs. Winds which paſs over mill-dams and marſhes in Auguſt and September, generally carry with them the ſeeds of fevers.

XII. The country in the neighbourhood of Philadelphia is much more ſickly than the central parts of the city, after the 20th of Auguſt.

XIII. The night-air is always unwholeſome from the 20th of Auguſt, eſpecially during the paſſive ſtate of the ſyſtem in *ſleep*. The frequent and ſudden changes of the air from heat to cold, (excluſive of its ſenſible qualities) render it unſafe at any time to ſleep with open windows.

XIV. Philadelphia became unuſually ſickly after the year 1778, during the late war, in conſequence of the meadows being overflowed to the ſouthward of the city, and of the cutting down of the trees by the Britiſh army, which formerly ſheltered the city from the exhalations of the grounds to the north and north-weſt. From the repairs of the banks of the meadows, which exclude tides and freſhes; from the cultivation of the grounds to the weſtward of the city, which were formerly covered with filth, or with ſtagnating waters; and laſtly, from the more regular cleaning of the ſtreets, and the encloſure of a large and offenſive dock which croſſed two of the principal ſtreets near the centre of the city, Philadelphia, from having been formerly the moſt ſickly, has become one of the healthieſt cities in the United States.

XV. Valetudinarians always enjoy the moſt health in Pennſylvania in the ſummer and winter months. The ſpring, in a particular manner, is very unfavourable to them.

I ſhall conclude the account of the influence of the climate of Pennſylvania upon the human body, with the following obſervations.

1. The ſenſations of heat and cold are influenced ſo much by outward circumſtances, that we often miſtake the degrees of them, by neglecting to uſe ſuch conveniences as are calculated to obviate the effects of their exceſs. A native of Jamaica often complains leſs of the heat, and a native of Canada of the cold, in their reſpective countries, than they do under certain circumſtances in Pennſylvania. Even a Pennſylvanian frequently complains leſs of the heat in Jamaica, and of the cold in Canada, than in his native ſtate. The reaſon of this

is plain. In countries where heat and cold are intenſe and regular, the inhabitants guard themſelves by accommodating their houſes and dreſſes to each of them. The inſtability and ſhort duration of exceſſive heat and cold in Pennſylvania, have unfortunately led its inhabitants, in many inſtances, to neglect adopting cuſtoms, which are uſed in hot and cold countries to guard againſt them. Where houſes are built with a ſouthern or ſouth-weſtern front expoſure, and where other accommodations to the climate are obſerved in their conſtruction, the diſagreeable exceſſes of heat and cold are rendered much leſs perceptible in Pennſylvania. Perhaps the application of the principles of Philoſophy and taſte to the conſtruction of our houſes within the laſt thirty or forty years, may be another reaſon why ſome old people have ſuppoſed that the degrees of heat and cold are leſs in Pennſylvania than they were in former years.

2. The number, height, and vegetable productions of the mountains in Pennſylvania, afford a favourable prognoſis of the future healthineſs of the ſtate. Excluſive of the beneficial effects of theſe mountains in producing ſalutary winds, and gentle rains, they will ſerve as a perpetual and in-

exhauſtible ſtore-houſe of that pure ſpecies of air, which has of late been proved to conſtitute the vital part of common air.

3. The variable nature of the climate of Pennſylvania does not render it *neceſſarily* unhealthy. Doctor Huxham has taught us, that the healthieſt ſeaſons in Great-Britain have often been accompanied by the moſt variable weather. His words upon this ſubject convey a reaſon for the fact. "When the conſtitutions of the year are frequent-"ly changing, ſo that by the *contraſt* a ſort of "*equilibrium* is kept up, and health with it; and "that eſpecially if perſons are careful to guard "themſelves well againſt theſe ſudden changes*." Perhaps no climate or country is unhealthy, where men acquire from experience, or tradition, the arts of accommodating themſelves to it. The hiſtory of all the nations in the world, whether ſavage, barbarous, or civilized, previouſly to a mixture of their manners by an intercourſe with ſtrangers, ſeems to favour this opinion. The climate of China appears, in many particulars, to reſemble that of Pennſylvania. The Chineſe wear looſe garments of different lengths, and increaſe or diminiſh the number of them, according to the frequent

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* Obſervations on the Air and Epidemic Diſeaſes, vol. I. p. 5.

and ſudden changes of their weather; hence they have very few acute diſeaſes amongſt them. Thoſe inhabitants of Pennſylvania who have acquired the arts of conforming to the changes and extremes of our weather in dreſs, diet, and manners, eſcape moſt of thoſe acute diſeaſes which are occaſioned by the ſenſible qualities of the air; and faithful inquiries and obſervations have proved, that they attain to as great ages as the ſame number of people in any part of the world.

# AN

# ACCOUNT

# OF THE

# *Bilious Remitting Fever,*

## AS IT APPEARED IN PHILADELPAIA IN THE SUMMER AND AUTUMN OF THE YEAR 1780.

BEFORE I proceed to deſcribe this fever, it will be neceſſary to give a ſhort account of the weather, and of the diſeaſes which preceded it.

The ſpring of 1780 was dry and cool. A catarrh appeared among children between one year and ſeven years of age. It was accompanied by a defluxion from the eyes and noſe, and by a cough and dyſpnœa, reſembling, in ſome inſtances, the cynanche trachealis, and in others a peripneumony. In ſome caſes it was complicated with the ſymptoms of a bilious remitting, and intermitting fever. The exacerbations of this fever were always attended by dyſpnœa and cough. A few patients expectorated blood. Some had ſwellings behind their ears, and others were affected with ſmall ulcers in the throat. I met with only one caſe of this fever in which the pulſe indicated bleeding. The reſt yielded in a few days to emetics, bliſters, and the bark, aſſiſted by the uſual more ſimple remedies in ſuch diſorders.

An intermittent prevailed among adults in the month of May.

July and Auguſt were uncommonly warm. The mercury ſtood on the 6th of Auguſt at 94½°, on the 15th of the ſame month at 95°, and for ſeveral days afterwards at 90°. Many labouring people periſhed during this month by the heat, and by drinking, not only cold water, but cold liquors of ſeveral kinds, while they were under the violent impreſſions of the heat.

The vomiting and purging prevailed univerſally, during theſe two warm months, among the children, and with uncommon degrees of mortality. Children from one year to eight and nine years old were likewiſe very generally affected by blotches and little boils, eſpecially in their faces. An eruption on the ſkin, called by the common people the prickly heat, was very common at this time among perſons of all ages. The winds during theſe months blew chiefly from the ſouth, and ſouthweſt. Of courſe they paſſed over the land which lies between the city, and the conflux of the rivers Delaware and Schuylkill, the peculiar ſituation of which, at that time, has been already deſcribed.

The dock, and the ſtreets of Philadelphia, ſupplied the winds at this ſeaſon, likewiſe, with a portion of their unwholeſome exhalations*.

The remitting fever made its firſt appearance in July and Auguſt, but its ſymptoms were ſo mild, and its extent ſo confined, that it excited no apprehenſions of its ſubſequent more general prevalence throughout the city.

On the 19th of Auguſt the air became ſuddenly very cool. Many hundred people in the city complained, the next day, of different degrees of indiſpoſition, from a ſenſe of laſſitude, to a fever of the remitting type. This was the ſignal of the epidemic. The weather continued cool during the remaining part of the month, and during the whole month of September. From the expoſure of the diſtrict of Southwark (which is often diſtinguiſhed by the name of the *Hill*) to the ſouth-weſt winds, the fever made its firſt appearance in that appendage of the city. Scarcely a family, and in many families ſcarcely a member of them, eſcaped it. From the Hill it gradually travelled along the Second-ſtreet from the Delaware, improperly called Front-ſtreet. For a while it was confined to this ſtreet only, after it entered the city, and hence it was called by ſome people the *Front-ſtreet fever*. It gradually ſpread through other parts of the city, but with very different degrees of violence. It prevailed but little in the Northern Liberties. It was ſcarcely known beyond Fourth-ſtreet from the Delaware. Intemperance in eating or drinking, riding in the ſun or rain, watching, fatigue, or even a fright, but more frequently cold, all ſerved to excite the ſeeds of this fever into action, whereever they exiſted.

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* The muſchetoes were uncommonly numerous during the autumn. A certain ſign (ſays Dr. Lind) of an unwholeſome atmoſphere.

All ages and both ſexes were affected by this fever. Seven of the practitioners of phyſic were confined by it nearly at the ſame time. The city, during the prevalence of the fever, was filled with an unuſual number of ſtrangers, many of whom, particularly of the Friends (whoſe yearly meeting was held in the month of September) were affected by it. No other febrile diſeaſe was obſerved during this time in the city.

This fever generally came on with rigor, but ſeldom with a regular chilly fit, and often without any ſenſation of cold. In ſome perſons it was introduced by a ſlight ſore throat, and in others, by a hoarſeneſs which was miſtaken for a common cold. A giddineſs in the head was the forerunner of the diſeaſe in ſome people. This giddineſs attacked ſo ſuddenly, as to produce, in ſeveral inſtances, a faintneſs, and even ſymptoms of apoplexy. It was remarkable that all thoſe perſons who were affected in this violent manner, recovered in two or three days.

I met with one inſtance of this fever attacking with coma, and another with convulſions, and with many inſtances in which it was introduced by a delirium.

The pains which accompanied this fever were exquiſitely ſevere in the head, back, and limbs. The pains in the head were ſometimes in the back parts of it, and at other times they occupied only the eyeballs. In ſome people, the pains were ſo acute in their backs and hips, that they could not lie in bed. In others, the pains affected the neck and arms, ſo as to produce in one inſtance a difficulty of moving the fingers of the right hand. They all complained more or leſs of a ſoreneſs in the ſeats of theſe pains, particularly when they occupied the head and eyeballs. A few complained of their fleſh being ſore to the touch, in every part of the body. From theſe circumſtances, the diſeaſe was ſometimes believed to be a rheumatiſm; but its more general name among all claſſes of people was, the *Break-bone fever*.

I met with one caſe of pain in the back, and another of an acute ear-ach, both of which returned periodically every night, and without any fever.

A nauſea univerſally, and in ſome inſtances a vomiting, accompanied by a diſagreeable taſte in the mouth, attended this fever. The bowels were, in moſt caſes, regular, except where the diſeaſe fell with its whole force upon them, producing a ſymptomatic dyſentery*.

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* A ſymptomatic dyſentery frequently accompanies the autumnal fevers in Pennſylvania. In the hilly parts of the ſtate, it has been remarked that it prevails chiefly on the *high* grounds;

The tongue was generally moiſt, and tinctured of a yellow colour.

The urine was high coloured, and in its uſual quantity in fevers.

The ſkin was generally moiſt, eſpecially where the diſeaſe terminated on the third or fourth day.

The pulſe was quick and full, but never hard, in a ſingle patient that came under my care, till the 28th of September.

It was remarkable, that little, and in ſome inſtances, no thirſt attended this fever.

A ſcreatus, or conſtant hawking and ſpitting, attended in many caſes through the whole diſeaſe, and was a favourable ſymptom.

There were generally remiſſions in this fever every morning, and ſometimes in the evening. The exacerbations were more ſevere every other day, and two exacerbations were often obſerved in one day.

grounds; while the remitting or intermitting fevers prevail in the neighbourhood *below* them.

A raſh often appeared on the third and fourth days, which proved favourable. This raſh was accompanied in ſome caſes by a burning in the palms of the hands and ſoles of the feet. Many people at this time, who were not confined to their beds, and ſome, who had no fever, had an effloreſcence on their ſkins.

In ſeveral perſons the force of the diſeaſe ſeemed to fall upon the face, producing ſwellings under the jaw and in the ears, which in ſome inſtances terminated in abſceſſes.

When the fever did not terminate on the third or fourth day, it frequently ran on to the eleventh, fourteenth, and even twentieth days, aſſuming in its progreſs, according to its duration, the uſual ſymptoms of the typhus gravior, or mitior, of Doctor Cullen. In ſome caſes, the diſcharge of a few ſpoons-full of blood from the noſe accompanied a ſolution of the fever on the third or fourth day; while in others, a profuſe hæmorrhage from the noſe, mouth, and bowels, on the tenth and eleventh days, preceded a fatal iſſue of the diſeaſe.

Several caſes came under my care, in which the fever was ſucceeded by a jaundice.

The diſeaſe terminated in ſome caſes without ſweating, or a ſediment in the urine; nor did I find ſuch patients more diſpoſed to relapſe than others, provided they took a ſufficient quantity of the bark.

About the beginning of October the weather became cool, accompanied by rain and an eaſterly wind. This cool and wet weather continued for four days. The mercury in the thermometer fell to 60°, and fires became agreeable. From this time the fever evidently declined, or was accompanied by inflammatory ſymptoms. On the 16th of October, I met with a caſe of inflammatory angina; and on the next day I viſited a patient who had a complication of the bilious fever with a pleuriſy, and whoſe blood diſcovered ſtrong marks of the preſence of the inflammatory diatheſis. His ſtools were of a green and black color. On the third day of his diſorder the raſh appeared on his ſkin, and on the fourth, in conſequence of a ſecond bleeding, his fever terminated with the common ſymptoms of a criſis.

During the latter end of October, and the firſt weeks in November, the mercury in the Thermometer fluctuated between 50° and 60°. Pleuriſies and inflammatory diſeaſes of all kinds now made their appearance. They were more numerous and more acute, than in this ſtage of the autumn, in former years. I met with one caſe of pleuriſy in November, which did not yield to leſs than four plentiful bleedings.

I ſhall now add a ſhort account of the METHOD I purſued in the treatment of this fever.

I generally began by giving a gentle vomit of tartar emetic. This medicine, if given while the fever was in its forming ſtate, frequently produced an immediate cure; and if given after its formation, on the *firſt* day, ſeldom failed of producing a criſis on the third or fourth day. The vomit always diſcharged more or leſs bile. If a nauſea, or an ineffectual attempt to vomit continued after the exhibition of the tartar emetic, I gave a ſecond doſe of it with the happieſt effects.

If the vomit failed of opening the bowels, I gave gentle doſes of ſalts and cream of tartar*, or of the butter-nut pill*, ſo as to procure two or three plentiful ſtools. The matter diſcharged from the bowels was of a highly bilious nature. It was ſometimes ſo acrid as to excoriate the rectum, and ſo offenſive, as to occaſion, in ſome caſes, ſickneſs and faintneſs both in the patients and in their attendants. In every inſtance the patients found relief by theſe evacuations, eſpecially from the pains in the head and limbs.

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* I have always found that cream of tartar renders the purging neutral ſalts leſs diſagreeable to the taſte and ſtomach; but accident has lately taught me, that the juice of two limes or of one lemon, with about half an ounce of leaf ſugar added to ſix drachms of Glauber or Epſom ſalt, in

In thoſe caſes, where the prejudices of the patients againſt an emetic, or where an advanced ſtate of pregnancy, or an habitual prediſpoſition to hœmatemeſis occurred, I diſcharged the bile entirely by means of the lenient purges that have been mentioned. In this practice I had the example of Doctor Cleghorn, who preſcribed purges with great ſucceſs in a fever of the ſame ſpecies in Minorca, with that which has been deſcribed†. Doctor Lining preſcribed purges with equal ſucceſs in an autumnal pleuriſy in South Carolina,

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in half a pint of boiling water, form a mixture that is nearly as pleaſant as ſtrong beverage.

[*] This pill is made from an extract of a ſtrong decoction of the inner bark of the white walnut-tree.

[†] The tertiana interpoſita remiſſione tantum, of Dr. Cullen.

which I take to be a ſpecies of a bilious remittent, accompanied by an inflammatory affection of the breaſt.

After evacuating the contents of the ſtomach and bowels, I gave ſmall doſes of tartar emetic, mixed with Glauber's ſalt. This medicine excited a general perſpiration. It likewiſe kept the bowels gently open, by which means the bile was diſcharged as faſt as it was accumulated.

I conſtantly recommended to my patients, in this ſtage of the diſorder, to *lie in bed*. This favoured the eruption of the raſh, and the ſolution of the diſeaſe by perſpiration. Perſons who ſtruggled againſt the fever by *ſitting up*, or who attempted to ſhake it off by labour or exerciſe, either ſunk under it, or had a ſlow recovery.

A clergyman of a reſpectable character from the country, who was attacked by the diſeaſe in the city, returned home, from a deſire of being attended by his own family, and died in a few days afterwards. This is only one, of many caſes, in which I have obſerved travelling, even in the eaſieſt carriages, to prove fatal in fevers after they were formed, or after the firſt ſymptoms had ſhewn themſelves. The quickeſt and moſt effectual way of conquering a fever, in moſt caſes, is, by an early ſubmiſſion to it.

The drinks I recommended to my patients were ſage and baum teas, apple[*] and tamarind water, weak punch, lemonade, and wine whey.

I found obvious advantages in many caſes, from the uſe of pediluvia, every night.

In every caſe, I found the patients refreſhed and relieved by frequent changes of their linen.

On the third or fourth day, in the forenoon, the pains in the head and back generally abated, with a ſweat which was diffuſed over the whole body. The pulſe at this time remained quick and weak. This was, however, no objection to the uſe of the bark, a few doſes of which immediately abated its quickneſs, and prevented a return of the fever.

If the fever continued beyond the third or fourth day without an intermiſſion, I always had recourſe to bliſters. Thoſe which were applied to the neck, and behind the ears produced the moſt immediate good effects. They ſeldom failed of producing an intermiſſion in the fever, the day after they were applied. Where delirium or coma attended, I applied the bliſter to the neck on the *firſt* day of the diſorder. A worthy family in this city will always aſcribe the life of a promiſing boy of ten years old, to the early application of a bliſter to the neck, in this fever.

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[*] That apple-water is moſt agreeable which is made by pouring boiling water upon ſlices of raw apples. It is more lively than that which is made by pouring the water on roaſted apples.

Where the fever did not yield to bliſters, and aſſumed the ſymptoms of typhus gravior or mitior, I gave the medicines uſually exhibited in both the ſpecies of that fever.

I took notice in the hiſtory of this fever, that it was ſometimes accompanied by the ſymptoms of a dyſentery. Where this diſorder appeared, I preſcribed lenient purges and opiates. Where theſe failed of ſucceſs, I gave the bark in the intermiſſions of the pain in the bowels, and applied bliſters to the wriſts. The good effects of theſe remedies led me to conclude, that the dyſentery was the febris introverſa of Dr. Sydenham.

I am happy in having an opportunity, in this place, of bearing a teſtimony in favour of the uſefulneſs of OPIUM in this diſorder, after the neceſſary evacuations had been made. I yielded, in preſcribing it at firſt, to the earneſt ſolicitations of my patients for ſomething to give them relief from their inſupportable pains, particularly when they were ſeated in the eye-balls and head. Its ſalutary effects in procuring ſweat, and a remiſſion of the fever, led me to preſcribe it afterwards in almoſt every caſe and always with the happieſt effects. Thoſe phyſicians enjoy but little pleaſure in practiſing phyſic, who know not how much of the pain and anguiſh of fevers, of a certain kind, may be leſſened by the judicious uſe of opium.

In treating of the remedies uſed in this diſorder, I have taken no notice of blood-letting. Out of ſeveral hundred patients whom I viſited in this fever, I did not meet with a ſingle caſe, before the 27th of September, in which the ſtate of the pulſe indicated this evacuation. It is true, the pulſe was *full*, but never *hard*. I acknowledge that I was called to ſeveral patients who had been bled without the advice of a phyſician, who recovered afterwards on the uſual days of the ſolution of the fever. This only can be aſcribed to that diſpoſition which Doctor Cleghorn attributes to fevers, to preſerve their types under every variety

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of treatment, as well as conſtitution. But I am bound to declare further, that I heard of ſeveral caſes in which bleeding was followed by a fatal termination of the diſeaſe.

In this fever relapſes were very frequent, from expoſure to the rain, ſun, or night air, and from an exceſs in eating or drinking.

The convaleſcence from this diſeaſe was marked by a number of extraordinary ſymptoms, which rendered patients the ſubjects of medical attention for many days after the pulſe became perfectly regular, and after the criſis of the diſeaſe.

A bitter taſte in the mouth, accompanied by a yellow colour on the tongue continued for near a week.

Moſt of thoſe who recovered complained of nauſea and a total want of appetite. A faintneſs, eſpecially upon ſitting up in bed, or in a chair, followed this fever. A weakneſs in the knees was univerſal. I met with two patients, who were moſt ſenſible of this weakneſs in the right knee. An inflammation in one eye, and in ſome inſtances in both eyes, occurred in ſeveral patients after their recovery.

But the moſt remarkable ſymptom of the convaleſcence from this fever, was an uncomman dejection of the ſpirits. I attended two young ladies who ſhed tears while they vented their complaints of their ſickneſs and weakneſs. One of them very aptly propoſed to me to change the name of the diſorder, and to call it in its preſent ſtage, inſtead of the Break-bone, the *Break-heart fever.*

To remove theſe ſymptoms, I gave the tincture of bark and elixir of vitriol in frequent doſes. I likewiſe recommended the plentiful uſe of ripe fruits; but I ſaw the beſt effects from temperate meals of oyſters, and a liberal uſe of porter. To theſe was added, gentle exerciſe in the open air, which gradually completed the cure.

# AN ACCOUNT OF THE *Scarlatina Anginoſa.*

## AS IT APPEARED IN PHILADELPHIA, IN THE YEARS 1783 AND 1784.

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THE beginning of the month of July was unuſually cool; inſomuch that the mercury in Farenheit's thermometer ſtood at 61° in the day time, and fires were very comfortable, eſpecially in the evening. In the laſt week but one, of this month, the weather ſuddenly became ſo warm, that the mercury roſe to 94½°, at which it remained for three days. As this heat was accompanied by no breeze from any quarter, the ſenſe of it was extremely diſtreſſing to many people. Upwards of twenty perſons died in the courſe of theſe three days, from the exceſs of the heat, and from drinking cold water. Three old people died ſuddenly within this ſpace of time. This extreme heat was ſucceeded by cool weather, the mercury having fallen to 60°, and the month cloſed with producing a few intermitting and remitting fevers, together with ſeveral caſes of inflammatory angina.

The weather in the month of Auguſt was extremely variable. The mercury, after ſtanding for ſeveral days at 92°, ſuddenly fell ſo low, as not only to render fires neceſſary, but in many places to produce froſt.

Every genus of fever made its appearance in this month. The ſynocha was ſo acute, in ſeveral caſes, as to require from three to four bleedings. The remitting fever was accompanied by an uncommon degree of nauſea and faintneſs. Several people died, after a few days illneſs, of the typhus gravior, of Dr. Cullen. The intermittents had nothing peculiar in them, either as to their ſymptoms or method of cure.

Towards the cloſe of the month, the ſcarlatina anginoſa made its appearance, chiefly among children.

The month of September was cool and dry, and the ſcarlatina anginoſa became epidemic among adults as well as young people. In moſt of the patients who were affected by it, it came on with a chillneſs and a ſickneſs at the ſtomach, or a vomitting; which laſt was ſo invariably preſent, that it was with me a pathognomonic ſign of the diſeaſe. The matter diſcharged from the ſtomach was always bile. The ſwelling of the throat was, in ſome inſtances ſo great, as to produce a difficulty of ſpeaking, ſwallowing, and breathing. In a few inſtances, the ſpeech was accompanied by a ſqueaking voice, reſembling that which attends the cynanche trachealis. The ulcers on the tonſils were deep, and covered with white, and in ſome inſtances, with black ſloughs. In ſeveral caſes there was a diſcharge of a thick mucus from the noſe, from the beginning, but it oftner occurred in the decline of the diſeaſe, which moſt frequently happened on the fifth day. Sometimes the ſubſiding of the ſwelling of the throat was followed by a ſwelling behind the ears.

An eruption on the ſkin generally attended the ſymptoms which have been deſcribed. But this ſymptom appeared with conſiderable variety. In ſome people it preceded, and in others followed the ulcers and ſwelling of the throat. In ſome, it appeared only on the outſide of the throat and on the breaſt; in others, it appeared chiefly on the limbs. In a few it appeared on the ſecond or third day of the diſorder, and never returned afterwards. I ſaw two caſes of eruption without a ſingle ſymptom of ſore throat. The face of one of thoſe patients was ſwelled, as in the eryſipelas. In the other, a young girl of ſeven years old, there was only a ſlight redneſs on the ſkin. She was ſeized with a vomiting, and died delirious in fifty-four hours. Soon after her death, a livid colour appeared on the outſide of her throat.

The bowels, in this degree of the diſorder, were in general regular. I can recollect but few caſes which were attended by a diarrhœa.

The fever which accompanied the diſorder was generally the typhus mitior of Doctor Cullen. In a few caſes it aſſumed the ſymptoms of the typhus gravior.

The diſeaſe frequently went off with a ſwelling of the hands and feet. I ſaw one inſtance in a gentlewoman, in whom this ſwelling was abſent, who complained of very acute pains in her limbs, reſembling thoſe of the rheumatiſm.

In two caſes which terminated fatally, there were large abſceſſes; the one on the outſide, and the other on the inſide of the throat. The firſt of theſe caſes was accompanied by troubleſome ſores on the ends of the fingers. One of theſe patients lived twenty-eight, and the other above thirty days, and both appeared to die from the diſcharge which followed the opening of their abſceſſes.

Between the degrees of the diſeaſe which I have deſcribed, there were many intermediate degrees of indiſpoſition which belonged to this diſorder.

I ſaw in ſeveral caſes a diſcharge from behind the ears, and from the noſe, with a ſlight eruption, and no ſore throat. All theſe patients were able to ſit up and walk about.

I ſaw one inſtance of a diſcharge from the inſide of one of the ears in a child, who had ulcers in his throat, and the ſqueaking voice.

In ſome, a pain in the jaw, with ſwellings behind the ears and a ſlight fever, conſtituted the whole of the diſeaſe.

In one caſe, the diſeaſe came on with a coma, and in ſeveral patients it went off with this ſymptom.

A few inſtances occurred of adults, who walked about, and even tranſacted buſineſs until a few hours before they died.

The intermitting fever, which made its appearance in Auguſt, was not loſt during the month of September. It continued to prevail, but with ſeveral peculiar ſymptoms. In many perſons it was accompanied by an eruption on the ſkin, and a ſwelling of the hands and feet. In ſome, it was attended by a ſore throat and pains behind the ears. Indeed, ſuch was the prevalence of the contagion which produced the ſcarlatina anginoſa, that many hundred people complained of ſore throats without any other ſymptom of indiſpoſition. The ſlighteſt occaſional or exciting cauſe, and particularly cold, ſeldom failed of producing the diſorder.

The month of October was much cooler than September, and the diſeaſe continued, but with leſs alarming ſymptoms. In ſeveral adults, who were ſeized with it, the hardneſs of the pulſe indicated blood-letting. The blood, in one caſe, was covered with a buffy coat, but beneath its ſurface it was diſſolved.

In the month of November the diſeaſe aſſumed ſeveral inflammatory ſymptoms, and was attended with much leſs danger than formerly. I viſited one patient whoſe ſymptoms were ſo inflammatory as to require two bleedings. During the decline of the diſeaſe, many people complained of troubleſome ſores on the ends of their fingers. A number of children likewiſe had ſore throats and fevers, with eruptions on their ſkins, which reſembled the chicken-pox. I am diſpoſed to ſuſpect that this eruption was the effect of the contagion of the ſcarlatina anginoſa, as ſeveral inſtances occurred of patients who had all the ſymptoms of this diſeaſe, in whom an eruption of white bliſters ſucceeded their recovery. This form of the diſeaſe has been called by Sauvage, the ſcarlatina varioloſa.

I ſaw one caſe of ſore throat, which was ſucceeded not only by ſwellings in the abdomen and limbs, but by a catarrh, which brought on a fatal conſumption.

A conſiderable ſhock of an earthquake was felt on the 29th of this month, at ten o'clock at night, in the city of Philadelphia; but no change was perceived in the diſeaſe, in conſequence of it.

In December, January, and February, the weather was intenſely cold. There was a thaw for a few days in January, which broke the ice of the Delaware, but it was followed by cold ſo exceſſive as to cloſe the river till the beginning of March. The mercury on the 28 and 29th of February, ſtood below 0 in Fareinheit's thermometer.

For a few weeks in the beginning of December the diſeaſe diſappeared in the circle of my patients, but it broke out with great violence the latter end of that month, and in the January following. Some of the worſt caſes that I met with, (three of which proved fatal) were in thoſe two months.

The diſeaſe diſappeared in the ſpring, but it ſpread afterwards through the neighbouring ſtates of New-Jerſey, Delaware and Maryland.

I ſhall now add an account of the remedies which I adminiſtered in this diſorder.

In every caſe that I was called to, I began the cure by giving a vomit joined with calomel. The vomit was either tartar emetic or ipecacuana, according to the prejudices, habits, or conſtitutions of my patients. A quantity of bile was generally diſcharged by this medicine. Beſides evacuating the contents of the ſtomach, it cleanſed the throat in its paſſage downwards. To enſure this effect from the calomel, I always directed it to be given mixed with ſyrup or ſugar and water, ſo as to diffuſe it generally over every part of the throat. The calomel ſeldom failed to produce two or three ſtools. In ſeveral caſes I was obliged, by the continuance of nauſea, to repeat the emetics, and always with immediate and obvious advantage. I gave the calomel in moderate doſes in every ſtage of the diſorder. To reſtrain its purgative effects, when neceſſary, I added to it a ſmall quantity of opium.

During the whole courſe of the diſorder, where the calomel failed of opening the bowels, I gave lenient purges, when a diſpoſition to coſtiveneſs required them.

The throat was kept clean by detergent gargles. In ſeveral inſtances I ſaw evident advantages from adding a few grains of calomel to them. In caſes of great difficulty of ſwallowing or breathing, the patients found relief from receiving the ſteams of warm water mixed with a little vinegar, through a funnel into the throat.

A perſpiration kept up by gentle doſes of antimonials, and diluting drinks, impregnated with wine, always gave relief.

In every caſe which did not yield to the above remedies on the third day, I applied a bliſter behind each ear, or one to the neck, and I think, always with good effects.

I met with no caſes in which the bark appeared to be indicated as an antiſeptic, except the three in which the diſeaſe proved fatal. Where the ſore throat was blended with the intermitting fever, the bark was given with advantage. But in common caſes it was unneceſſary. Subſequent obſervations have led me to believe, with Doctor Withering, that it is ſometimes hurtful in this diſorder.

This diſeaſe proved fatal in many parts of the country, upon its firſt appearance; but wherever the mode of treatment here delivered was adopted, its mortality was ſoon checked. The calomel was uſed very generally in New-Jerſey and New-York. In the Delaware ſtate, a phyſician of character made it a practice not only to give calomel, but to anoint the outſide of the throat with mercurial ointment.

# ADDITIONAL OBSERVATIONS

UPON THE

# *Scarlatina Anginoſa.*

THIS diſeaſe has prevailed in Philadelphia, at different ſeaſons, ever ſince the year 1783. It has blended itſelf occaſionally with all our epidemics. Many caſes have come under my notice ſince its firſt appearance, in which dropſical ſwellings have ſucceeded the fever. In ſome inſtances there appeared to be effuſions of water not only in the limbs and abdomen, but in the thorax. They yielded, in every caſe that I attended, to purges of calomel and jalap. Where theſe ſwellings were neglected, they ſometimes proved fatal.

In the winter of 1786-7, the ſcarlatina anginoſa was blended with the cynanche parotidea, and in one inſtance with a typhus mitior. The laſt was in a young girl of nine years of age. She was ſeized with a vomiting of bile and an efflorefcence on her breaſt, but diſcovered no other ſymptoms of the ſcarlatina anginoſa till the ſixteenth day of her fever, when a ſwelling appeared on the outſide of her throat; and after her recovery, a pain and ſwelling in one of her knees.

In the month of July 1787, a number of people were affected by ſudden ſwellings of their lips and eyelids. Theſe ſwellings generally came on in the night, were attended with little or no pain, and went off in two or three days. I met with only one caſe in which there was a different iſſue to theſe ſymptoms. It was in a patient in the Pennſylvania hoſpital, in whom a ſwelling in the lips ended in a ſuppuration, which, notwithſtanding the liberal uſe of bark and wine, proved fatal in the courſe of twelve days.

In the months of June and July 1788, a number of people were affected by ſudden ſwellings, not only of the lips, but of the cheeks and throat. At the ſame time many perſons were affected by an inflammation of the eyes. The ſwellings were attended with more pain than they were the year before, and ſome of them required one or two purges to remove them; but in general they went without medicine, in two or three days.

Is it proper to refer theſe complaints to the ſame contagion which produces the ſcarlatina anginoſa?

The prevalence of the ſcarlatina anginoſa at the *ſame time* in this city; its diſpoſition to produce ſwellings in different parts of the body; and the analogy of the intermitting fever, which often conceals itſelf under ſymptoms that are foreign to its uſual type; all ſeems to render this conjecture probable. In one of the caſes of an inflammation of the eye, which came under my notice, the patient was affected by a vomiting a few hours before the inflammation appeared, and complained of a ſickneſs at his ſtomach for two or three days afterwards. Now a vomiting and nauſea appear to be pathognomonic ſymptoms of the ſcarlatina anginoſa.

In the autumn of 1788, the ſcarlatina anginoſa appeared with different degrees of violence in many parts of the city. In two inſtances it appeared with an obſtinate diarrhœa; but it was in young ſubjects, and not in adults, as deſcribed by Doctor Withering. In both caſes, the diſeaſe proved fatal; the one on the third, the other on the fifth day.

In the month of December of the ſame year, I ſaw one caſe in which a running from one of the ears and a deafneſs came on, on the fifth day immediately after the diſcharge of mucus from the noſe had ceaſed. This caſe terminated favourably on the ninth day, but was ſucceeded for ſeveral days afterwards by a troubleſome cough.

I ſhall conclude this eſſay by the following remarks:

1. Camphor has often been ſuſpended in a bag from the neck, as a preſervative againſt this diſeaſe. Repeated obſervations have taught me, that it poſſeſſes little or no efficacy for this purpoſe. I have had reaſon to entertain a more favourable opinion of the benefit of waſhing the hands and face with vinegar, and of rinſing the mouth and throat with vinegar and water every morning, as means of preventing this diſorder.

2. Whenever I have been called to a patient where the ſcarlatina appeared to be in a *forming* ſtate, a vomit of ipecacuana or tartar emetic,

mixed with a few grains of calomel, has never failed of completely checking the diſorder, or of ſo far mitigating its violence, as to diſpoſe it to a favourable iſſue in a few days; and if theſe obſervations ſhould ſerve no other purpoſe than to awaken the early attention of patients and phyſicians to this ſpeedy and effectual remedy, they will not have been recorded in vain.

3. When the contagion of this diſeaſe has been received into the body, a purge has prevented its being excited into action, or rendered the diſorder mild, throughout a whole family. For this practice I am indebted to ſome obſervations on the Scarlatina, publiſhed by Dr Sims in the firſt volume of the Medical Memoirs.

# AN INQUIRY INTO THE CAUSE AND CURE OF THE *Cholera Infantum.*

BY this name I mean to deſignate a diſeaſe, called, in Philadelphia, the "vomiting and purging of children." From the regularity of its appearance in the ſummer months, it is likewiſe known by the name of "the diſeaſe of the ſeaſon." It prevails in moſt of the large towns in the United States. It is diſtinguiſhed in Charleſtown in South Carolina, by the name of "the April and May diſorder," from making its firſt appearance in thoſe two months. It ſeldom appears in Philadelphia till the middle of June, or the beginning of July, and generally continues till near the middle of September. Its frequency and danger are always in proportion to the heat of the weather. It affects children from the firſt or ſecond week after their birth, till they are two years old. It ſometimes begins with a diarrhœa, which continues for ſeveral days without any other ſymptom of indiſpoſition; but it more frequently comes on with a violent vomiting and purging, and a high fever. The matter diſcharged from the ſtomach and bowels is generally yellow or green, but the ſtools are ſometimes ſlimy and bloody, without any tincture of bile. In ſome inſtances they are nearly as limpid as water. Worms are frequently diſcharged in each kind of the ſtools that has been deſcribed. The children in this ſtage of the diſorder, appear to ſuffer a good deal of pain. They draw up their feet, and are never eaſy in one poſture. The pulſe is quick and weak. The head is unuſually warm, while the extremities retain their natural heat, or incline to be cold. The fever is of the remitting kind, and diſcovers evident exacerbations, eſpecially in the evenings. The diſeaſe affects the head ſo much, as in ſome inſtances to produce ſymptoms not only of delirium, but of mania, inſomuch that the children throw their heads backwards and forwards, and ſometimes make attempts to ſcratch, and to bite, their parents or nurſes. A ſwelling frequently occurs in the abdomen, and in the face and limbs. An intenſe thirſt attends every ſtage of the diſorder. The eyes appear languid and hollow, and the children generally ſleep with them half cloſed. Such is the inſenſibility of the ſyſtem in ſome inſtances in this diſorder, that flies have been ſeen to alight upon the eyes when open, without exciting a motion in the eyelids to remove them. Sometimes the vomiting continues without the purging, but more generally, the purging continues without the vomiting, through the whole courſe of the diſorder. The ſtools are frequently large, and extremely fœtid, but in ſome inſtances they are without ſmell, and reſemble drinks or aliment which has been taken into the body. The diſeaſe is ſometimes fatal in a few days. I once ſaw it carry off a child in four and twenty hours. Its duration is varied by the ſeaſon of the year, and by the changes in the temperature of the weather. A cool day frequently abates its violence, and diſpoſes it to a favourable termination. It often continues with occaſional variations in its appearance, for ſix weeks or two months. Where the diſeaſe has been of long continuance, the approach of death is gradual, and attended by a number of diſtreſſing ſymptoms. An emaciation of the body to ſuch a degree, as that the bones come through the ſkin, livid ſpots, a ſingultus, covulſions, a ſtrongly marked hippocratic countenance, and a ſore mouth, generally precede the fatal termination of this diſorder. Few children ever recover, after the laſt ſymptoms which have been mentioned make their appearance.

This diſeaſe has been aſcribed to ſeveral cauſes; of each of which I ſhall take notice in order.

I. It has been attributed to *dentition.* To refute this opinion, it will be neceſſary to obſerve, that it appears only in one ſeaſon of the year. Dentition, I acknowledge, ſometimes aggravates the diſorder; hence we find it is moſt ſevere in that period of life, when the greateſt number of teeth make their appearance, which is generally about the 10th month. I think I have obſerved more children to die of this diſorder at that age, than at any other.

II. Worms have likewiſe been ſuſpected of being the cauſe of this diſeaſe. To this opinion, I object the uncertainty of worms ever producing an idiopathic fever, and the improbability of their combinining in ſuch a manner as to produce an annual epidemic diſeaſe of any kind. But further, we often ſee the diſorder in all its force, before that age, in which worms uſually produce diſeaſes; we likewiſe often ſee it reſiſt the moſt powerful anthelmintic medicines; and laſtly, it appears from diſſection, where the diſeaſe has proved fatal, that not a ſingle worm has been diſcovered in the bowels. It is true, worms are in ſome inſtances diſcharged in this diſorder, but they are frequently diſcharged in greater numbers in the hydrocephalus internus, and in the ſmall-pox, and yet who will aſſert either of thoſe diſeaſes to be produced by worms.

III. The *ſummer fruits* have been accuſed of producing this diſorder. To this opinion, I object, that the diſeaſe is but little known in country places, where children eat much more fruit than in cities. As far as I have obſerved, I am diſpoſed to believe that the moderate uſe of ripe fruits, rather tends to prevent, than to induce the diſeaſe.

From the diſcharge of bile which generally introduces the diſeaſe, from the remiſſions and exacerbations of the fever which accompanies it, and from its occurring nearly in the ſame ſeaſon with the cholera and remitting fever in adults, I am diſpoſed to conſider it as a modification of the ſame diſeaſes. Its appearance earlier in the ſeaſon than the cholera and remitting fever in adults, muſt be aſcribed to the conſtitutions of children being more prediſpoſed from weakneſs to be acted upon, by the remote cauſes which produce thoſe diſorders.

I ſhall now mention the remedies which are proper and uſeful in this diſorder.

I. The firſt indication of cure is to evacuate the bile from the ſtomach and bowels. This ſhould be done by gentle doſes of ipecacuanha, or tartar emetic. The vomits ſhould be repeated occaſionally, if indicated, in every ſtage of the diſorder. The bowels ſhould be opened by means of manna, caſtor oil, or magneſia. I have generally found rhubarb improper for this purpoſe, while the ſtomach was in a very irritable ſtate. In thoſe caſes, where there is reaſon to believe that the offending contents of the primæ viæ have been diſcharged by nature, (which is often the caſe) the emetics and purges ſhould by no means be given; but, inſtead of them, recourſe muſt be had to

II. Opiates. A few drops of liquid laudanum, combined in a teſtaceous julep, with pepper-mint or cinnamon-water, ſeldom fail of compoſing the ſtomach and bowels. In ſome inſtances, this medicine alone ſubdues the diſeaſe in two or three days; but where it does not prove ſo ſucceſsful, it produces a remiſſion of pain, and of other diſtreſſing ſymptoms, in every ſtage of the diſorder.

III. Demulcent and diluting drinks have an agreeable effect in this diſeaſe. Mint and mallow teas, or a tea made of blackberry roots infuſed in cold water, together with a decoction of the ſhavings of hartſhorn and gum arabic with cinnamon, ſhould all be given in their turns for this purpoſe.

IV. Glyſters made of flaxſeed tea, or of mutton broth, or of ſtarch diſſolved in water, with a few drops of liquid laudanum in them, give eaſe, and produce other uſeful effects.

V. Plaſters of Venice treacle applied to the region of the ſtomach, and flannels dipped in infuſions of bitter and aromatic herbs in warm ſpirits, or Madeira wine, and applied to the region of the abdomen, often afford conſiderable relief.

VI. As ſoon as the more violent ſymptoms of the diſeaſe are compoſed, tonic and cordial medicines ſhould be given. The bark in decoction, or in ſubſtance, (where it can be retained in that form) mixed with a little nutmeg, often produce the moſt ſalutary effects. Port wine or claret mixed with water are likewiſe proper in this ſtage of the diſorder. After the diſeaſe has continued for ſome time, we often ſee an appetite ſuddenly awakened for articles of diet of a ſtimulating nature. I have ſeen many children recover from being gratified in an inclination to eat ſalted fiſh, or the different kinds of ſalted meat. In ſome inſtances they diſcover an appetite for butter, and the richeſt gravies of roaſted meats, and eat them with obvious relief to all their ſymptoms. I once ſaw a child of ſixteen months old, perfectly reſtored, from the loweſt ſtage of this diſorder, by eating large quantities of rancid Engliſh cheeſe, and drinking two or three glaſſes of Port wine every day. She would in no inſtance eat bread with the cheeſe, nor taſte the wine, if it was mixed with water.

We ſometimes ſee relief given by the uſe of the warm bath, in caſes of obſtinate pain. The bath is more effectual, if warm wine is uſed, inſtead of water.

I have had but few opportunities of trying the effects of cold water applied to the body in this diſorder; but from the benefit which attended its uſe in the caſes in which it was preſcribed, I am diſpoſed to believe that it would do great ſervice, could we overcome the prejudices which ſubſiſt in the minds of parents againſt it.

After all that has been ſaid in favour of the remedies that have been mentioned, I am ſorry to add, that I have very often ſeen them all adminiſtered without effect. My principal dependence, therefore, for many years, has been placed upon

VII. Country air. Out of many hundred children whom I have ſent into the country in every ſtage of this diſorder, I have loſt only three; two of whom were ſent, contrary to my advice, into that unhealthy part of the neighbourhood of Philadelphia called the *Neck*, which lies between the city and the conflux of the rivers Delaware and Schuylkill. I have ſeen one cure performed by this remedy, after convulſions had taken place. To derive the utmoſt benefit from the country air, children ſhould be carried out on horſeback, or in a carriage, every day; and they ſhould be expoſed to the open air as much as poſſible in fair weather in the day time. Where the convenience of the conſtant benefit of country air cannot be obtained, I have ſeen evident advantages from taking children out of the city once or twice a day. It is extremely agreeable to ſee the little ſufferers revive as ſoon as they eſcape from the city air, and inſpire the pure air of the country.

I ſhall conclude this inquiry, by recommending the following methods of preventing this diſorder, all of which have been found by experience to be uſeful.

1. The daily uſe of the cold bath.

2. A faithful and attentive accommodation of the dreſſes of children, to the ſtate and changes of the air.

3. A moderate quantity of ſalted meat taken occaſionally in thoſe months in which this diſeaſe uſually prevails. It is perhaps in part from the daily uſe of ſalted meat in diet that the children of country people eſcape this diſorder.

4. The uſe of ſound old wine in the ſummer months. From a tea-ſpoon-full, to half a wine glaſs full, according to the age of the child, may be given every day. It is remarkable, that the children of perſons in eaſy circumſtances, who ſip occaſionally with their parents the remains of a glaſs of wine after dinner, are much leſs ſubject

to this diſorder, than the children of poor people, who are without the benefit of that article of diet.

5. Cleanlineſs both with reſpect to the ſkin and cloathing of children. Perhaps the neglect of this direction may be another reaſon why the children of the poor are moſt ſubject to this diſorder.

6. The removal of children into the country before the approach of warm weather. This advice is peculiarly neceſſary during the whole period of dentition. I have never known but one inſtance of a child being affected by this diſorder, who had been carried into the country in order to avoid it.

# OBSERVATIONS

## ON THE

## *Cynanche Trachealis*.

I TAKE great pleaſure in thus publicly acknowledging a miſtake, which I committed in my letter to Doctor Millar, publiſhed by him in London in the year 1770, in ſuppoſing that there was but *one* ſpecies of this diſorder, and that that was *ſpaſmodic*. I am now ſatisfied, from repeated obſervations, that there is another ſpecies, which I ſhall take the liberty of calling the *cynanche trachealis humida*.

I exclude, as a ſpecies of this diſorder, the cynanche trachealis maligna. Many of the ſymptoms of the cynanche trachealis occur in the malignant ſore throat, but they ſhould by no means conſtitute the name of a ſpecies of that diſeaſe. I have ſeen the ſame ſymptoms in the ſcarlatina anginoſa, and yet I never thought of ranking a cynanche trachealis ſcarlatina among the ſpecies of that diſorder. I have likewiſe ſeen the cynanche trachealis in the laſt ſtage of the ſecondary fever of the ſmall-pox, without ſuppoſing that it ought to derive a ſpecific name from that diſeaſe. The ſpecies of diarrhœa would be innumerable, if, every time it occured as a ſymptom of other diſorders, it was to receive a ſpecific name, and to be conſidered as an idiopathic diſorder.

The reaſons which I offered in my letter to Doctor Millar, for believing that the cynanche trachealis is frequently a ſpaſmodic diſorder, continue to operate upon me with as much force as ever. But a number of diſſections related by different authors, ſatisfy me, that the cynanche trachealis humida is a diſtinct ſpecies from the ſpaſmodic, and requires a different method of cure.

The cynanche trachealis ſpaſmodica is known,

1. By coming on *ſuddenly*, and that generally in the night.

2. By frequent and perfect *intermiſſions* of the ſymptoms for hours, and in ſome inſtances for

days, without the leaſt ſenſible diſcharge from the trachea. And,

3. By yielding to antiſpaſmodic remedies, particularly to the warm bath.

If theſe facts had left any reaſons to doubt of a ſpaſmodic ſpecies of this diſorder, I ſhould have been confirmed in the opinion, by the diſſection of a child in the year 1770, who died by it, in whom no marks were to be found of a membrane, or even of mucus in the trachea, The lungs and trachea appeared to be in a ſound ſtate.

The cynanche trachealis humida is known,

1. By coming on *gradually*, and that moſt commonly in the day time.

2. By its continuing or increaſing for ſeveral days without any remarkable remiſſion, or even abatement of the ſymptoms.

3. By the diſcharge of phlegm or mucus from the trachea, and the occaſional appearance of it in the ſtools. And,

4. By not yielding to antiſpaſmodic medicines.

On the eighth of December 1790, I examined the lungs and trachea of a child (aged five years) who died of this ſpecies of the cynanche trachealis. I found about two tea-ſpoonfulls of mucus in the trachea. The bronchial veſſels ſeemed to be full of the ſame kind of liquid. There was no appearance of a membrane in the trachea. Its anterior part was a little inflamed. Blood drawn from this child during its illneſs, was ſizy.

My opinion of the cauſe of the membrane which is formed in the trachea continues to be the ſame as expreſſed in my former publication*, with this difference, that I believe the membrane to be the effect of the humid ſpecies only, and that it is not an accidental conſequence of the ſpaſmodic, as I once ſuppoſed. The ſymptoms of the ſpaſmodic ſpecies are deſcribed by Dr. Millar, in his obſervations on the aſthma and hooping cough, in the following words: "Children (ſays he) at play "were ſometimes ſeized with it, but it generally "came on at night. A child who went to bed in "perfect health, waked an hour or two afterwards "in a fright, with his face much fluſhed, or ſometimes of a livid colour; incapable of deſcribing "what he felt; breathing with much labour, and "with a convulſive motion in the belly; the returns of inſpiration and expiration quickly ſucceeding each other in that particular ſonorous "manner, which is often obſerved in hyſteric paroxyſms. The child's terror ſometimes augmented the diſorder. He clung to the nurſe, "and if he was not ſpeedily relieved by coughing, belching, ſneezing, vomiting, or purging, "the ſuffocation increaſed, and he died in the paroxyſm."

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* "The veſſels of the trachea and bronchiæ always "abound with a thin mucus, which is poured into them in "proportion as they are irritated by inflammation, or the "action of the external air. Children abound with a greater "quantity of mucus in theſe parts than adults; and when "it is accumulated in the trachea or bronchiæ in a greater "quantity than ordinary, they are unable, upon the ac- "count of their weakneſs, to bring it up. It is eaſy to "conceive in what manner it is converted into a thin mem- "brane, after its more fluid parts are diſſipated. We have "an analogy of this in the noſe. Were the paſſages of "this organ leſs in our reach, it is probable a membrane "reſembling that found in the trachea would be found in "it every four and twenty hours, eſpecially when it was "affected by a cold. We always find the phlegm accumu- "lated in proportion to the time the diſorder has conti- "nued.

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"nued. In all the caſes of membrane mentioned by Doctor Home, the patients never died before the *third* day, "and in many caſes, not before the fourth and fifth days." Letter to Doctor Millar.

To this deſcription of the cynanche trachealis, I ſhall add the three following obſervations:

1. The noiſe which patients make in coughing in this diſorder, reſembles the barking of a young dog. This ſymptom is ſo univerſally preſent, that I always rely upon it as a pathognomonic ſign of the diſeaſe before it is completely formed. I have obſerved this barking cough, in one inſtance of cynanche trachealis humida, to continue for ſeveral days after the patient was out of danger.

2. During the continuance of the diſeaſe there is frequently an eruption of little red blotches on the ſkin, which is accompanied by ſenſible relief to the patient. This eruption ſometimes appears and diſappears two or three times in the courſe of the diſeaſe.

3. The diſeaſe is not confined wholly to children. I have ſeen two caſes of the ſpaſmodic ſpecies in adults.

Doctor Cullen has given birth to a controverſy reſpecting the inflammatory nature of the cynanche trachealis. He has included it in the order of phlegmaſiæ in his claſs of pyrexia. I acknowledge that I have generally ſeen both the ſpecies that have been mentioned, without inflammatory ſymptoms, and ſometimes without fever, eſpecially in the firſt ſtage of the diſorder. When either ſpecies have been attended by a hard pulſe, it has been only in plethoric habits, or when it has been complicated with ſymptoms of catarrh or peripneumony.

Perhaps it may appear improper, after ſuch a declaration, to have adopted the name given to this diſorder by Doctor Cullen. I ſhould have had no objection to Doctor Michaelis's name of "angina polypoſa," did it not exclude the ſpaſmodic ſpecies of this diſeaſe; nor ſhould I heſitate in adopting the more generic term of "ſuffocatio ſtridula" of Doctor Home, if the diſeaſe were not now ſo generally known by the name given it by Doctor Cullen*.

The remedies to be uſed in cynanche trachealis ſpaſmodica, are, 1. Bleeding, when it is connected with pneumonic ſymptoms; 2. Vomits; 3. Purges;

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* The vulgar name of this diſeaſe in Pennſylvania is the *Hives*. It appears to be a corruption of the word "heaves," which took its riſe from the manner in which the lungs *heave* in reſpiration. The worſt degrees of the diſorder are called the "bowel-hives," from the great motion of the abdominal muſcles in reſpiration.

and, 4. Antiſpaſmodic medicines, more eſpecially the warm bath, opium, aſſafætida and bliſters.

The remedies which are proper in the cynanche trachealis humida, are the three firſt which are mentioned for the cure of the ſpaſmodic ſpecies, and CALOMEL. Our principal dependence muſt be placed upon this laſt medicine. A large doſe of it ſhould be given as ſoon as the diſeaſe diſcovers itſelf, and ſmaller doſes ſhould be given every day, while any of its ſymptoms continue. The bark is ſcarcely a more certain remedy for intermittents, than calomel, when thus adminiſtered, is in this ſpecies of cynanche.

In what manner does the calomel act in this diſorder? Is it by *increaſing* the ſecretion of mucus in the numerous glands of the fauces, œſophagus, ſtomach and bowels, and thereby *leſſening* the excretion of it in the trachea? The analogy of the ſecretions and excretions, in other parts of the body, whether promoted by nature or art, ſeems to favour this conjecture.

I ſhall only add upon the ſubject of this diſorder, that inſtances of its mortality have been very rare in Philadelphia, ſince the general uſe of the remedies which have been mentioned.

# AN ACCOUNT OF THE EFFECTS OF BLISTERS AND BLEEDING, IN THE CURE OF OBSTINATE *Intermitting Fevers.*

THE efficacy of theſe remedies will probably be diſputed by every regular-bred phyſician, who has not been a witneſs of their utility in the above diſorder; but it becomes ſuch phyſicians, before they decide upon this ſubject, to remember, that many things are true in medicine, as well as in other branches of philoſophy, which are very improbable.

In all thoſe caſes of *autumnal* intermittents, whether quotidian, tertian, or quartan, in which the bark did not ſucceed after three or four days trial, I have

I have ſeldom found it fail after the application of bliſters to the wriſts.

But in thoſe caſes where bliſters had been neglected, or applied without effect, and where the diſeaſe had been protracted into the *winter* months, I have generally cured it by means of one or two moderate bleedings.

The pulſe in thoſe caſes is generally full, and ſometimes a little hard, and the blood when drawn for the moſt part appears ſizy.

The bark is ſeldom neceſſary to prevent the return of the diſorder. It is always ineffectual, where blood-letting is indicated. I have known ſeveral inſtances where pounds of this medicine have been taken without effect, in which the loſs of ten or twelve ounces of blood has immediately cured the diſorder.

How ſhall we reconcile the practice of bleeding in intermittents, with our modern theories of fever?

May not ſuch congeſtions be formed by them in the viſcera, as to produce the ſame ſpecies of inflammatory action which occurs in ſeveral other inflammatory diſeaſes from local cauſes?

Doctor Cullen has taught us, in his account of the chronic hepatitis, that there may be topical affection and inflammatory diatheſis, without much pain or fever; and had I not witneſſed ſeveral caſes of this kind, I ſhould have been forced to have believed it poſſible, not only in this diſorder, but in many others, from the facts which were communicated to me by Doctor Michaelis in his viſit to Philadelphia in the year 1783.

It would be foreign to the preſent ſubject, or I could here demonſtrate, that debility (ſo common and univerſal in intermittents) is a *neceſſary* prediſpoſing cauſe of *all* inflammatory diſorders.

I once intended to have added to this account of the efficacy of bliſters and bleeding in curing obſtinate intermittents, teſtimonies from a number of medical gentlemen, of the ſucceſs with which they have uſed them; but theſe vouchers have become ſo numerous, that they would ſwell this eſſay far beyond the limits I wiſh to preſcribe to it.

# AN ACCOUNT OF THE DISORDER OCCASIONED BY DRINKING *Cold Water in Warm Weather*, AND THE METHOD OF CURING IT.

FEW ſummers elapſe in Philadelphia, in which there are not inſtances of many perſons being affected by drinking cold water. In ſome ſeaſons four or five perſons have died ſuddenly from this cauſe, in one day. This mortality falls chiefly upon the labouring part of the community, who ſeek to allay their thirſt by drinking the water from the pumps in the ſtreets, and who are too impatient, or too ignorant, to uſe the neceſſary precautions for preventing its morbid or deadly effects upon them. Theſe accidents ſeldom happen, except when the mercury riſes above 85° in in Farenheit's thermometer.

Three circumſtances generally concur to produce diſeaſe or death from drinking cold water. 1. The patient is extremely warm. 2. The water is extremely cold. And, 3. A large quantity of it is ſuddenly taken into the body. The danger from drinking the cold water is always in proportion to the degrees of combination which occur in the three circumſtances that have been mentioned.

The following ſymptoms generally follow, where cold water has been taken, under the above circumſtances, into the body:

In a few minutes after the patient has ſwallowed the water, he is affected by a dimneſs of ſight, he ſtaggers in attempting to walk, and unleſs ſupported, falls to the ground; he breaths with difficulty; a rattling is heard in his throat; his noſtrils and cheeks expand and contract in every act of reſpiration; his face appears ſuffuſed with blood, and of a livid colour; his extremities become cold, and his pulſe imperceptible; and unleſs relief is ſpeedily obtained, the diſorder terminates in death in four or five minutes.

This deſcription includes only the leſs common caſes of the effects of drinking a *large* quantity of *cold* water, when the body is *preternaturally* heated. More frequently, patients are ſeized with acute ſpaſms in the breaſt and ſtomach. Theſe ſpaſms are ſo painful as to produce ſyncope, and even aſphyxia. They are ſometimes of the tonic, but more frequently of the clonic kind. In the intervals of the ſpaſms the patient appears to be perfectly well. The intervals between each ſpaſm become longer or ſhorter, according as the diſeaſe tends to life or death.

It may not be improper to take notice, that punch, beer, and even toddy, when drank under the ſame circumſtances as cold water, have all been known to produce the ſame morbid and fatal effects.

I know of but one certain remedy for this diſeaſe, and that is LIQUID LAUDANUM. The doſes of it, as in other caſes of ſpaſm, ſhould be proportioned to the violence of the diſeaſe. From a teaſpoonful to near a table-ſpoonful have been given in ſome inſtances, before relief has been obtained. Where the powers of life appear to be ſuddenly ſuſpended, the ſame remedies ſhould be uſed, which have been ſo ſucceſsfully employed in recovering perſons ſuppoſed to be dead from drowning.

Care ſhould be taken in every caſe of diſeaſe, or apparent death, from drinking cold water, to prevent the patient's ſuffering from being ſurrounded, or even attended by too many people.

Perſons who have been recovered from the immediate danger which attends this diſeaſe, are ſometimes affected after it, by inflammations and obſtructions in the breaſt or liver. Theſe generally yield to the uſual remedies which are adminiſtered in thoſe complaints, when they ariſe from other cauſes.

If neither the voice of reaſon, nor the fatal examples of thoſe who have periſhed from this cauſe, are ſufficient to produce reſtraint in drinking a *large* quantity of *cold* liquors, when the body is *preternaturally* heated, then let me adviſe to

1. Graſp the veſſel out of which you are about to drink for a minute or longer with both your hands. This will abſtract a portion of heat from the body, and impart it at the ſame time to the cold liquor, provided the veſſel is made of metal, glaſs, or earth; for heat follows the ſame laws, in many inſtances, in paſſing through bodies, with regard to its relative velocity, which we obſerve to take place in electricity.

2. If you are not furniſhed with a cup, and are obliged to drink by bringing your mouth in contact with the ſtream which iſſues from a pump, or a ſpring, always waſh your hands and face previouſly to your drinking, with a little of the cold water. By receiving the ſhock of the water firſt upon thoſe parts of the body, a portion of its heat is conveyed away, and the vital parts are thereby defended from the action of the cold.

# AN ACCOUNT
## OF THE EFFICACY OF
## COMMON SALT,
## IN THE CURE OF
## *HÆMOPTYSIS.*

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FROM the preſent eſtabliſhed opinions and practice reſpecting the cauſe and cure of hæmoptyſis, the laſt medicine that would occur to a regular-bred phyſician for the cure of it, is COMMON SALT; and yet I have ſeen and heard of a great number of caſes, in which it has been adminiſtered with ſucceſs.

The mode of giving it, is to pour down from a tea to a table-ſpoonful of clean fine ſalt, as ſoon as poſſible after the hæmorrhage begins from the lungs. This quantity generally ſtops it; but the doſe muſt be repeated daily for three or four days, to prevent a return of the diſorder. If the bleeding continues, the ſalt muſt be continued till it is checked, but in larger doſes. I have heard of ſeveral inſtances in which two table-ſpoonsful were taken at one time for ſeveral days.

It ſometimes excites a ſickneſs at the ſtomach, and never fails to produce a burning ſenſation in the throat in its paſſage into the ſtomach, and conſiderably thirſt afterwards.

I have found this remedy to ſucceed equally well in hæmorrhagies, whether they were active or paſſive, or whether they ocurred in young or in old people.

I had preſcribed it for ſeveral years before I could ſatisfy myſelf with a theory, to account for its extraordinary action upon the human body. My enquiries led me to attend more particularly to the following facts:

1. Thoſe perſons who have been early inſtructed in vocal muſic, and who uſe their vocal organs moderately through life, are ſeldom affected by an hæmorrhage from the lungs.

2. Lawyers, players, public cryers, and city watchmen, all of whom exerciſe their lungs either by long or loud ſpeaking, are leſs affected by this diſorder, than perſons of other occupations.

I acknowledge I cannot extend this obſervation to the public teachers of religion. I have known ſeveral inſtances of their being affected by hæmoptyſis; but never but one in which the diſorder came on in the pulpit, and that was in a perſon who had been recently cured of it. The caſes which I have ſeen, have generally been brought on by catarrhs.

To this diſorder, the practice of ſome of our American preachers diſpoſes them in a peculiar manner; for it is very common with this claſs of them, to expoſe themſelves to the cold or evening air immediately after taking, what a celebrated and eloquent preacher uſed to call a *pulpit ſweat.*

3. This hæmorrhage chiefly occurs in debilitated habits, or in perſons afflicted by ſuch a diſpoſition to conſumption, as indicates a weak and relaxed ſtate of the lungs.

4. It generally occurs when the lungs are in a paſſive ſtate; as in ſitting, walking, and more

frequently in lying. Many of the caſes that I have known, have occurred during *ſleep* in the middle of the night.

From theſe facts, is it not probable that the common ſalt, by acting primarily and with great force upon the throat, extends its ſtimulus to the bleeding veſſel, and by giving it a tone, checks the further effuſion of blood?

I ſhall only add to this conjecture the following obſervations:

1. I have never known the common ſalt perform a cure, where the hemorrhage from the lungs has been a ſymptom of a conſumption. But even in this caſe it gives a certain temporary relief.

2. The exhibition of common ſalt in the hæmoptyſis, ſhould by no means ſupercede the uſe of occaſional bleeding when indicated by plethora, nor of that diet which the ſtate of the pulſe, or of the ſtomach, may require.

3. I have given the common ſalt in one caſe with ſucceſs, in an hæmorrhage from the ſtomach, accompanied by a vomiting; and have heard of

ſeveral caſes in which it has been ſuppoſed to have checked a diſcharge of blood from the noſe and uterus, but I can ſay nothing further in its favour in theſe laſt hæmorrhages, from my own experience.

It may perhaps ſerve to leſſen the prejudices of phyſicians againſt adopting improvements in medicine, that are not recommended by the authority of colleges or univerſities, to add, that we are indebted to an old woman, for the diſcovery of the efficacy of common ſalt in the cure of hæmoptyſis.

# FREE THOUGHTS
## UPON THE
## CAUSE AND CURE
## OF THE
## *Pulmonary Conſumption.*

THE ancient Jews uſed to ſay that a man does not fulfil his duties in life, who paſſes through it, without building a houſe, planting a tree, and leaving a child behind him. A phyſician, in like manner, ſhould conſider his obligations to his profeſſion and ſociety as undiſcharged, who has not attempted to leſſen the number of incurable diſeaſes. This is my apology for preſuming to make the conſumption the ſubject of a medical inqury.

Perhaps I may ſuggeſt an idea, or fact, that may awaken the ideas and facts which now lie uſeleſs in the memories or common-place books of other phyſicians; or I may direct their attention

tion to ſome uſeful experiments upon this ſubject.

I ſhall begin my obſervations upon the conſumption, by remarking,

1. that it is unknown among the Indians in North-America.

2. It is ſcarcely known by thoſe citizens of the United States, who live in the *firſt* ſtage of civilized life, and who have lately obtained the title of the *firſt ſettlers*.

The principal occupations of the Indian conſiſt in war, fiſhing, and hunting. Thoſe of the firſt ſettler, are fiſhing, hunting, and the laborious employments of ſubduing the earth, cutting down foreſts, building a houſe and barn, and diſtant excurſions in all kinds of weather, to mills and courts, all of which tend to excite and preſerve in the ſyſtem, ſomething like the Indian vigour of conſtitution.

3. It is leſs common in country places than in cities, and increaſes in both, with intemperance and ſedentary modes of life.

4. Ship and houſe carpenters, ſmiths, and all thoſe artificers whoſe buſineſs requires great exertions of ſtrength in the *open* air in *all* ſeaſons of the year, are leſs ſubject to this diſorder, than men who work under cover, and at occupations which do not require the conſtant action of their limbs.

5. Women who ſit more than men, and whoſe work is connected with leſs exertion, are moſt ſubject to the conſumption.

From theſe facts it would ſeem, that the moſt probable method of curing the conſumption, is to revive in the conſtitution, by means of exerciſe or labour, that vigour which belongs to the Indians, or to mankind in their firſt ſtage of civilization.

The efficacy of theſe means of curing conſumption will appear, when we inquire into the relative merit of the ſeveral remedies which have been uſed by phyſicians in this diſorder.

I ſhall not produce among theſe remedies the numerous receipts for ſyrups, boluſſes, electuaries, decoctions, infuſions, pills, medicated waters, powders, draughts, mixtures, and diet-drinks, which have ſo long and ſo ſteadily been uſed in this diſeaſe; nor ſhall I mention as a remedy, the beſt accommodated diet, ſubmitted to with the moſt patient ſelf-denial, for not one of them all without the aid of exerciſe has ever, I believe, cured a ſingle conſumption.

1. SEA-VOYAGES have cured conſumptions; but it has been only when they have been ſo long, or ſo frequent, as to ſubſtitute the long continuance of gentle, to violent degrees of exerciſe of a ſhorter duration, or where they have been accompanied by ſome degree of the labour and care of navigating the ſhip.

2. A CHANGE of CLIMATE has often been preſcribed for the cure of conſumptions, but I do not recollect an inſtance of its having ſucceeded, except when it has been accompanied by exerciſe, as in travelling, or by ſome active laborious purſuit.

Doctor Gordon of Madeira, aſcribes the inefficacy of the air of Madeira in the conſumption, in part to the difficulty patients find of uſing exerciſe in carriages, or even on horſeback, from the badneſs of the roads in that iſland.

3. JOURNIES have often performed cures in the conſumption, but it has been chiefly when they have been long, and accompanied by difficulties which have rouſed and invigorated the powers of the mind and body.

4. VOMITS and NAUSEATING MEDICINES have been much celebrated for the cure of conſumptions. Theſe, by procuring a temporary determination to the ſurface of the body, ſo far leſſen the pain and cough as to enable patients to uſe profitable exerciſe. Where this has not accompanied or ſucceeded the exhibition of vomits, I believe they have ſeldom afforded any *permanent* relief.

5. BLOOD-LETTING has often relieved conſumptions; but it has been only by removing the troubleſome ſymptoms of inflammatory diatheſis, and thereby enabling the patients to uſe exerciſe, or labour, with advantage.

6. VEGETABLE BITTERS and ſome of the STIMULATING GUMS have in ſome inſtances afforded relief in conſumptions; but they have done ſo only in thoſe caſes where there was great debility, accompanied by a total abſence of inflammatory diatheſis. They have moſt probably acted by

their tonic qualities as ſubſtitutes for labour and exerciſe.

7. A PLENTIFUL and REGULAR PERSPIRATION excited by means of a flannel ſhirt worn next to the ſkin, or by means of a ſtove-room, or by a warm climate, has in many inſtances *prolonged* life in conſumptive habits; but all theſe remedies have acted as palliatives only, and thereby have enabled the conſumptive patients to enjoy the more beneficial effects of exerciſe.

8. BLISTERS, SETONS, and ISSUES, by determining the perſpirable matter from the lungs to the ſurface of the body, leſſen pain and cough, and thereby prepare the ſyſtem for the more ſalutary effects of exerciſe.

9. The effects of SWINGING upon the pulſe and reſpiration, leave us no room to doubt of its being a tonic remedy, and therefore a ſafe and agreeable ſubſtitute for exerciſe.

From all theſe facts it is evident that the remedies for conſumptions muſt be ſought for in thoſe *exerciſes and employments which give the greateſt vigour to the conſtitution.* And here I am happy in being able to produce ſeveral facts which demonſtrate the ſafety and certainty of this method of cure.

During the late war, I ſaw three inſtances of perſons in confirmed conſumptions who were perfectly cured by the hardſhips of a military life. They had been my patients previouſly to their entering into the army. Beſides theſe, I have heard of four well atteſted caſes of ſimilar recoveries from nearly the ſame remedies. One of theſe was the ſon of a farmer in New-Jerſey, who was ſent to ſea as the laſt reſource for a conſumption. Soon after he left the American ſhore, he was taken by a Britiſh cruiſer, and compelled to ſhare in all the duties and hardſhips of a common ſailor. After ſerving in this capacity for twenty-two months, he made his eſcape, and landed at Boſton, from whence he travelled on foot to his father's houſe, (nearly four hundred miles) where he arrived in perfect health.

Doctor Way of Wilmington informed me, that a certain Abner Cloud, who was reduced ſo low by a pulmonary conſumption as to be beyond all relief from medicine, was ſo much relieved by ſleeping in the open air, and by the uſual toils of building a hut and improving a farm in the unſettled parts of a new country in Pennſylvania, that he thought him in a fair way of a perfect recovery.

Doctor Latimer of Wilmington had been long afflicted with a cough and an occaſional hæmoptyſis. He entered into the American army as a ſurgeon, and ſerved in that capacity till near the end of the war; during which time he was perfectly free from all pulmonic complaints. The ſpitting of blood returned ſoon after he ſettled in private practice. To remedy this complaint, he had recourſe to a low diet, but finding it ineffectual, he partook liberally of the uſual diet of healthy men, and he now (as he lately informed me) enjoys a good ſhare of health.

It would be very eaſy to add many other caſes, in which labour, the employments of agriculture, and a life of hardſhip by ſea and land, have prevented, relieved, or cured, not only the conſumption, but pulmonary diſeaſes of all kinds.

To the caſes that have been mentioned, I ſhall add only one more, which was lately communicated to me by the venerable Doctor Franklin, whoſe converſation at all times conveys inſtruction, and not leſs in medicine than upon other ſubjects. In travelling, many years ago, through New-

England, the Doctor overtook the poſt-rider; and after ſome inquiries into the hiſtory of his life, he informed him that he was bred a ſhoemaker; that his confinement, and other circumſtances, had brought on a conſumption, for which he was ordered by a phyſician to ride on horſeback. Finding this mode of exerciſe too expenſive, he made intereſt, upon the death of an old poſt-rider, to ſucceed to his appointment, in which he perfectly recovered his health in two years. After this he returned to his old trade, upon which his conſumption returned. He again mounted his horſe, and rode poſt in all ſeaſons and weathers, between New-York and Connecticut river, (about 140 miles) in which employment he continued upwards of thirty years, in perfect health.

Theſe facts, I hope, are ſufficient to eſtabliſh the advantages of reſtoring the original vigour of the conſtitution, in every attempt to effect a radical cure of conſumption.

But how ſhall theſe remedies be applied in the time of peace, or in a country where the want of woods, and brooks without bridges, forbid the attainment of the laborious pleaſures of the Indian mode of hunting; or where the univerſal extent of civilization does not admit of our adviſing the toils of a new ſettlement, and improvements upon *bare* creation? Under theſe circumſtances, I conceive ſubſtitutes may be obtained for each of them, nearly of equal efficacy, and attainable with much leſs trouble.

1. Doctor Sydenham pronounced *riding on horſe-back*, to be as certain a cure for conſumptions as bark is for an intermitting fever. I have no more doubt of the truth of this aſſertion, than I have that inflammatory fevers are now leſs frequent in London than they were in the time of Doctor Sydenham. If riding on horſeback in conſumptions has ceaſed to be a remedy in Britain, the fault is in the patient, and not in the remedy. "It is a ſign that the ſtomach requires milk, "(ſays Doctor Cadogan) when it cannot bear it." In like manner, the inability of the patient to bear this manly and wholeſome exerciſe, ſerves only to demonſtrate the neceſſity and advantages of it. I ſuſpect the ſame objections to this exerciſe which have been made in Britain, will not occur in the United States of America; for the Americans, with reſpect to the ſymptoms and degrees of epidemic and chronic diſeaſes appear to be nearly in the ſame ſtate that the inhabitants of England were in the ſeventeenth century. I can eaſily conceive the vigour of the human conſtitution

tion to have been ſuch in Doctor Sydenham's time, as that a defluxion or ulcer in the lungs ſhould have had no more effect in increaſing the action of the arterial ſyſtem, than a moderate inflammation of the eyes has at preſent in exciting an inflammatory fever in a good conſtitution; hence the ſafety and advantage formerly of riding on horſeback in pulmonic complaints. We find, in proportion to the decline of the vigour of the body, that many occaſional cauſes produce fever and inflammation, which would not have done it an hundred years ago.

2. The laborious employments of agriculture, if ſteadily purſued, and accompanied at the ſame time by the ſimple, but wholeſome diet of a farm-houſe, and a hard bed, would probably afford a good ſubſtitute for the toils of a ſavage or military life.

3. Such occupations or profeſſions as require conſtant labour or exerciſe in the open air in all kinds of weather, may eaſily be choſen for a young man who, either from hereditary prediſpoſition, or an accidental affection of the lungs, is in danger of falling into a conſumption. In this we ſhould imitate the advice given by ſome wiſe men, always to prefer thoſe profeſſions for our ſons

which are the leaſt favourable to the corrupt inclinations of their hearts. For example, where an undue paſſion for money, or a crafty diſpoſition diſcover themſelves in early life, we are directed to oppoſe them by the leſs profitable and more diſintereſted profeſſions of divinity, or phyſic, rather than cheriſh them by trade, or the practice of the law*.

4. There is a caſe recorded by Dr. Smollet, of the efficacy of the *cold bath* in a conſumption; And I have heard of its having been uſed with ſucceſs in the caſe of a negro man in one of the Weſt-India Iſlands. To render this remedy uſeful, or even ſafe, it will be neceſſary to join it with labour, or to uſe it in degrees that ſhall prevent the alternation of the ſyſtem with vigour and debility; for I take the cure of conſumption to

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* It is very common for parents to prefer ſedentary occupations for ſuch of their children who are of delicate conſtitutions, and the more active occupations for thoſe of them who are robuſt. The *reverſe* of this practice ſhould be followed. The weakly children ſhould be trained to the laborious, and the robuſt to the ſedentary occupations. From a neglect of this practice, many hundred apprentices to taylors, ſhoemakers, conveyancers, watchmakers, ſilverſmiths, mantua-makers, &c. &c. periſh every year by conſumptions.

depend upon the ſimple action of tonic, without the leaſt mixture of debilitating powers. Indeed, I conceive it to be eaſier to palliate the ſymptoms, and prolong life, by the uſe of powers which are *ſimply debilitating*, than by a mixture of both of them. This is not a ſolitary fact in the human body. We often ſee a ſtiff neck and ſpaſms, brought on by a perſon's being expoſed, at the ſame time, to a ſtream of air from a door or a window, and to the heat of a warm room, where neither would have been injurious if it had acted ſingly upon the ſyſtem. There are many extremes in phyſic, as in other things, which meet in a point. There is an inflammatory diatheſis connected with debility, as certainly as with an exceſs of tone in the arterial ſyſtem. And I think I have ſeen greater degrees of this inflammatory diatheſis in the male inhabitants of cities, than of the country, and more in women than in men. I have moreover ſeen the moſt acute inflammatory diſeaſes where the ſyſtem had been previouſly debilitated by a long continuance of warm weather, or of an obſtinate intermitting fever, and in too many inſtances by the uſe of ſpirituous liquors. It is the preſence of this ſpecies of inflammatory diatheſis which renders conſumptions ſo much more difficult to cure than formerly? Is it *this* which often renders riding on horſeback ſo ineffectual, or ſo injurious in this diſorder? I ſuſpect it is; and it is to be lamented that it often requires ſo much time, or ſuch remedies to remove this ſpecies of inflammatory diatheſis, as to reduce the patient too low to make uſe of thoſe remedies afterwards which would effect a radical cure.

If it were poſſible to graduate the tone of the ſyſtem by means of a ſcale, I would add, that to cure conſumptions, the ſyſtem ſhould be raiſed to the higheſt degree of this ſcale. Nothing ſhort of an equilibrium of tone, or a free and vigorous action of every muſcle and viſcus in the body, will fully come up to a radical cure for conſumptions.

In regulating the diet of conſumptive patients, I conceive it to be as neceſſary to feel the pulſe, as it is in determining when and in what quantity to draw blood. Where inflammatory diatheſis prevails, a vegetable diet is certainly proper; but where the patient has *eſcaped*, or *paſſed* this ſtage of the diſorder, I believe a vegetable diet alone to be injurious; and am ſure a moderate quantity of animal food may be taken with advantage. In both caſes, the diet ſhould conſiſt, as much as poſſible, of one kind of aliment.

The preſence or abſence of this inflammatory diatheſis, furniſhes the indications for adminiſtering or refraining from the uſe of the bark and balſamic medicines. With all the teſtimonies of their having done miſchief, many of which I could produce, I have known ſeveral caſes in which they have been given with obvious advantage; but it was only when there was a total abſence of inflammatory diatheſis.

Perhaps the remedies I have recommended, and the opinions I have delivered, may derive ſome ſupport from attending to the analogy of ulcers on the legs, and in other parts of the body. The firſt of theſe occur chiefly in habits debilitated by ſpirituous liquors, and the laſt frequently in habits debilitated by the ſcrophula. In curing theſe diſorders, it is in vain to depend upon internal or external medicines. The whole ſyſtem muſt be ſtrengthened, or we do nothing; and this is to be effected only by exerciſe and a generous diet.

In relating the facts that are contained in this eſſay, I wiſh I could have avoided reaſoning upon them; eſpecially as I am confident of the certainty of the facts, and ſomewhat doubtful of the truth of my reaſonings.

I ſhall only add, that if the cure of conſumptions ſhould at laſt be effected by remedies in every reſpect the oppoſites of thoſe palliatives which are now faſhionable and univerſal, no more will happen than what we have already ſeen in the tetanus, the ſmall-pox, and the management of fractured limbs.

Should this be the caſe, we ſhall not be ſurpriſed to hear of phyſicians, inſtead of preſcribing any one, or all of the medicines formerly enumerated for conſumptions, ordering their patients to exchange the amuſements, or indolence of a city, for the toils of a country life; of their adviſing farmers to exchange their plentiful tables, and comfortable fire-ſides, for the ſcanty but ſolid ſubſiſtence, and midnight expoſure of the herdſman; or of their recommending, not ſo much the exerciſe of a *paſſive* ſea-voyage, as the *active* labours and dangers of a common ſailor. Nor ſhould it ſurpriſe us, after what we have ſeen, to hear patients relate the pleaſant adventures of their excurſions or labours, in queſt of their recovery from this diſorder, any more than it does now to ſee a ſtrong or well ſhaped limb that has been broken; or to hear a man talk of his ſtudies, or pleaſures, during the time of his being inoculated and attended for the ſmall-pox.

I will not venture to aſſert, that there does not exiſt a medicine which ſhall ſupply, at leaſt in ſome degree, the place of the labour or exerciſes, whoſe uſefulneſs in conſumptions has been eſtabliſhed by the facts that have been mentioned. Many inſtances of the analogous effects of medicines, and of exerciſe upon the human body, forbid the ſuppoſition. I ſhall only add, that if there does exiſt in nature ſuch a medicine, I am diſpoſed to believe it will be found in the claſs of TONICS. If this ſhould be the caſe, I conceive its ſtrength, or its doſe, muſt far exceed the preſent ſtate of our knowledge or practice, with reſpect to the efficacy or doſe of tonic medicines.

I except the diſorder, which ariſes from recent abſceſſes in the lungs, from the general obſervation which has been made, reſpecting the inefficacy of the remedies that were formerly enumerated for the cure of conſumptions without labour or exerciſe. Theſe abſceſſes, often occur without being preceded by general debility, or accompanied by a conſumptive diatheſis, and are frequently cured by nature, or by very ſimple medicines.

# OBSERVATIONS

UPON

# WORMS

IN THE ALIMENTARY CANAL.

AND UPON

# ANTHELMINTIC MEDICINES.

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WITH great diffidence I venture to lay before the public my opinions upon worms: nor ſhould I have preſumed to do it, had I not entertained a hope of thereby exciting further inquiries upon this ſubject.

When we conſider how univerſally worms are found in all young animals, and how frequently they exiſt in the human body, without producing diſeaſe of any kind, it is natural to conclude, that they ſerve ſome uſeful and neceſſary purpoſes in the animal œconomy. Do they conſume the ſuperfluous aliment which all young animals are diſpoſed to take before they have been taught, by experience or reaſon, the bad conſequences which ariſe from it? It is no objection to this opinion, that worms are unknown in the human body in ſome countries. The laws of nature are diverſified, and often ſuſpended under peculiar circumſtances in many caſes, where the departure from uniformity is ſtill more unaccountable, than in the preſent inſtance. Do worms produce diſeaſes from an *exceſs* in their *number*, and an *error* in their place in the ſame manner that blood, bile and air produce diſeaſes from an *error* in their place, or from *exceſs* in their *quantities?* Before theſe queſtions are decided, I ſhall mention a few facts which have been the reſult of my own obſervations upon this ſubject.

1. In many inſtances I have ſeen worms diſcharged in the ſmall-pox and meaſles, from children who were in perfect health previouſly to their being attacked by thoſe diſorders, and who never before diſcovered a ſingle ſymptom of worms. I ſhall ſay nothing here of the ſwarms of worms which are diſcharged in fevers of all kinds, until I attempt to prove that an idiopathic fever is never produced by worms.

2. Nine out of ten of the caſes which I have ſeen of worms, have been in children of the groſſeſt habits and moſt vigorous conſtitutions*. This is more eſpecially the caſe where the worms are diſlodged by the ſmall-pox and meaſles.

3. In weakly children, I have often known the moſt powerful anthelmintics given without bringing away a ſingle worm. If theſe medicines have afforded any relief, it has been by their tonic quality. From this fact, is it not probable—The conjecture I am afraid is too bold—but I will riſk it. Is it not probable, I ſay, that children are ſometimes diſordered from the want of worms? Perhaps the tonic medicines which have been mentioned, render the bowels a more quiet and comfortable aſylum for them, and thereby provide the ſyſtem with the means of obviating the effects of

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* Since the above obſervations upon worms were committed to paper, I have met with the following facts, in a letter from Doctor Capelle of Wilmington, which has been read in the College of Phyſicians of Philadelphia. In the livers of ſixteen, out of eighteen rats which he diſſected, he informed me that he found a number of the tænia worms. The rats were fat, and appeared in other reſpects to have been in perfect health. The two rats in which he found no worms, he ſays, " were very lean, and their livers ſmaller " in proportion than the others."

crapulas, to which all children are diſpoſed. It is in this way that nature, in many inſtances, cures evil by evil. I confine the ſalutary office of worms only to that ſpecies of them which is known by the name of the round worm, and which occurs moſt frequently in children.

Is there any ſuch diſeaſe as an idiopathic WORM-FEVER? The Indians in this country ſay there is not, and aſcribe the diſcharge of worms to a fever, and not a fever to the worms*.

By adopting this opinion, I am aware that I contradict the obſervations of many eminent and reſpectable phyſicians.

Doctor Huxham deſcribes an epidemic pleuriſy, in the month of March in the year 1740, which he ſuppoſes was produced by his patients feeding upon ſome corn that had been injured by the rain the Auguſt before†. He likewiſe mentions that a number of people, and theſe too of the elderly ſort‡, were afflicted at one time with worms in the month of April in the year 1743.

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[*] See the Inquiry into the Diſeaſes of the Indians, p. 24.

[†] Vol. II. of his Epidemics, p. 56. [‡] P. 136.

Lieutaude gives an account of an epidemic worm-fever from Velchius, an Italian phyſician *; and Sauvages deſcribes, from Vandermonde, an epidemic dyſentery from worms, which yielded finally only to worm medicines †. Sir John Pringle, and Doctor Monro, likewiſe frequently mention worms as accompanying the dyſentery and remitting fever, and recommend the uſe of calomel as an antidote to them.

I grant that worms appear more frequently in ſome epidemic diſeaſes than in others, and oftener in ſome years than in others. But may not the ſame heat, moiſture and diet, which produced the diſeaſes, have produced the worms? And may not their diſcharge from the bowels have been occaſioned in thoſe epidemics, as in the ſmall-pox and meaſles, by the increaſed heat of the body; by the want of nouriſhment; or by an anthelmintic quality being accidentally combined with ſome of the medicines that are uſually given in fevers?

In anſwer to this, we are told that we often ſee the criſis of a fever brought on by the diſcharge of worms from the bowels by means of a purge,

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* Vol. I. p. 76.

† Vol. II. p. 329.

or by an anthelmintic medicine. Whenever this is the caſe, I believe it is occaſioned by offending bile being diſlodged by means of the purge at the ſame time with the worms, or by the anthelmintic medicine (if not a purge) having been given on, or near one of the uſual critical days of the fever. What makes the latter ſuppoſition probable is, that worms are ſeldom ſuſpected in the beginning of fevers, and anthelmintic medicines ſeldom given, till every other remedy has failed of ſucceſs; and this generally happens about the uſual time in which fevers terminate in life or death.

It is very remarkable, that ſince the diſcovery and deſcription of the hydrocephalus internus, we hear and read much leſs than formerly of worm-fevers. I ſuſpect that diſorder of the brain has laid the foundation for the principal part of the caſes of worm-fevers which are upon record in books of medicine. I grant that worms ſometimes increaſe the danger from fevers, and often confound the diagnoſis and prognoſis of them, by a number of new and analogous ſymptoms. But here we ſee nothing more than that complication of ſymptoms which often occurs in diſeaſes of a very different and oppoſite nature. How often are we puzzled by hyſteric and hypocondriac ſymptoms in a fever; and yet what phyſician ever thought of an hyſteric or an hypocondriac fever*?

Having rejected worms as the cauſe of fevers, I proceed to remark, that the diſeaſes moſt commonly produced by them, belong to the claſs of NEUROSES. And here I might add, that there is ſcarcely a diſeaſe, or a ſymptom of a diſeaſe, belonging to this claſs, which is not produced by worms. It would be only publiſhing extracts from books, to deſcribe them.

The *chronic* and *nervous* diſeaſes of children, which are ſo numerous and frequently fatal, are, I believe, moſt commonly occaſioned by worms. There is no great danger, therefore, of doing miſchief by preſcribing anthelmintic medicines in all our firſt attempts to cure the chronic and nervous diſeaſes.

I have taken great pains to find out, whether the preſence of the different ſpecies of worms might not be diſcovered by certain peculiar ſymptoms;

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* I have been much gratified by finding myſelf ſupported in the above theory of worm-fevers, by the late Dr. William Hunter, and by Dr. Butter in his excellent treatiſe upon the infantile remitting fever.

but all to no purpoſe. I once attended a girl of twelve years of age in a fever, who diſcharged four yards of a tænia, and who was ſo far from having diſcovered any peculiar ſymptom of this ſpecies of worms, that ſhe had never complained of any other indiſpoſition, than now and then a ſlight pain in the ſtomach, which often occurs in young girls from a ſedentary life, or from errors in their diet. I beg leave to add further, that there is not a ſymptom which has been ſaid to indicate the preſence of worms of any kind, as the cauſe of a diſeaſe, that has not deceived me; and none oftner than the one that has been ſo much depended upon, viz. the picking of the noſe. A diſcharge of worms from the bowels, is, perhaps, the only ſymptom that is pathognomonic of their preſence in the inteſtines.

I ſhall now make a few remarks upon anthelmintic remedies.

But I ſhall firſt give an account of ſome experiments which I made in the year 1771, upon the common earth-worm, in order to aſcertain the anthelmintic virtues of a variety of ſubſtances. I made choice of the earth-worm for this purpoſe, as it is, according to naturaliſts, exactly the ſame in its ſtructure, manner of ſubſiſtence, and mode of propagating its ſpecies, with the round worm of the human body.

In the firſt column I ſhall ſet down, under diſtinct heads, the ſubſtances in which worms were placed; and in the ſecond and third columns the *time* of their death, from the action of theſe ſubſtances upon them.

|  | Hours. | Minutes. |
|---|---|---|
| I. BITTER and ASTRINGENT SUBSTANCES. |  |  |
| Watery Infuſion of Aloes, | 2 | 48 |
| ——— of Rhubarb, | 1 | 30 |
| ——— of Peruvian bark, | 1 | 30 |
| II. PURGES. |  |  |
| Watery Infuſion of Jalap, | 1 | — |
| ——— of Bears-foot, | 1 | 17 |
| ——— of Gamboge, | 1 | — |
| III. SALTS. |  |  |
| 1. *Acids.* |  |  |
| Vinegar, - - - | — | 1½ convulſed. |
| Lime Juice, | — | 1 |
| Diluted nitrous Acid, | — | 1½ |
| 2. *Alkali.* |  |  |
| A watery Solution of Salt of Tartar, - - - | — | 2 convulſed, throwing up a mucus on the ſurface of the water. |
| 3. *Neutral Salts.* |  |  |
| In a watery Solution of common Salt, - - - | — | 1 convulſed. |
| —— of Nitre, - - | — | ditto. |
| —— of Sal Diuretic, - - | — | ditto. |
| —— of Sal Ammoniac, - | — | 1½ |
| —— of common Salt and Sugar, - - | — | 4 |

| *4. Earthy and Metallic Salts.* | Hours. | Minutes. |
|---|---|---|
| In a watery Solution of Epſom Salt, - - | — | 15½ |
| —— of Rock Alum, - | — | 10 |
| —— of Corroſive Sublimate, - | — | 1½ convulſed. |
| —— of Calomel, - - | — | 49 |
| —— of Turpeth Mineral, | — | 1 convulſed. |
| —— of Sugar of Lead, | — | 3 |
| —— of green Vitriol, - | — | 1 |
| —— of blue Vitriol. - | — | 10 |
| —— of white Vitriol, - | — | 30 |
| IV. METALS. | — | |
| Filings of Steel, - - | 1 | 25½ |
| Filings of Tin - - | | — |
| V. CALCAREOUS EARTH. | 2 | |
| Chalk, - - - | | — |
| VI. NARCOTIC SUBSTANCES. | | |
| Watery Infuſion of Opium, | — | 11½ convulſed. |
| —— of Carolina Pink-root, | — | 33 |
| —— of Tobacco, | — | 14 |
| VII. ESSENTIAL OILS. | | |
| Oil of Wormwood, - - - | — | 3 convulſed. |
| —— of Mint, - - - | — | 3 |
| —— of Caraway Seed, | — | 3 |
| —— of Amber, - - | — | 1½ |
| —— of Anniſeed, - | — | 4½ |
| —— of Turpentine, - | — | 6 |
| VIII. ARSENIC. | | |
| A watery Solution of white Arſenic, - - | near 2 | — |
| IX. FERMENTED LIQUORS. | | |
| In Madeira Wine, - | — | 3 convulſed. |
| — Claret, - - - | — | 10 |

| X. Distilled Spirit. | Hours. | Minutes. |
|---|---|---|
| Common Rum, - - | — | 1 convulſed. |
| XI. The fresh Juices of ripe Fruits. | | |
| The Juice of red Cherries, | — | 5⅔ |
| —— of black ditto, | — | 5 |
| —— of red Currants, - | — | 2½ |
| —— of Gooſeberries, - | — | 3½ |
| —— of Whortleberries, - | — | 12 |
| —— of Blackberries, - | — | 7 |
| —— of Raſberries, - | — | 5½ |
| —— of Plumbs, - - | — | 13 |
| —— of Peaches, - - | — | 25 |
| —— of Watermelons, no effect, - - | | — |
| XII. Saccharine Substances. | | |
| Honey, - - | — | 7 |
| Molaſſes, - - | — | 7 |
| Brown Sugar, - - | — | 30 |
| Manna, - - - | — | 2½ |
| XIII. In Aromatic Substances. | | |
| Camphor, - - - | — | 5 |
| Pimento, - - - | — | 3½ |
| Black Pepper, - - | — | 45 |
| XIV. Foetid Substances. | | |
| Juice of Onions, - - | — | 3½ |
| Watery Infuſion of Aſſafœtida, - - | — | 27 |
| —— Santonicum, or Worm Seed, - - | 1 | |
| XV. Miscellaneous Substances. | | |
| Sulphur mixed with Oil, | 2 | — |
| Æthiops Mineral, - | 2 | |
| Sulphur, - - - | 2 | |

| | | |
|---|---|---|
| Solution of Gunpowder, | — | 1½ |
| ———of Soap, - - | — | 19 |
| Oxymel of Squills, - | — | 3½ |
| Sweet Oil. - - - | 2 | 30 |

In the application of theſe experiments to the human body, an allowance muſt always be made for the alteration which the ſeveral anthelmintic ſubſtances that have been mentioned, may undergo from mixture and diffuſion in the ſtomach and bowels.

In order to derive any benefit from theſe experiments, as well as from the obſervations that have been made upon anthelmintic medicines, it will be neceſſary to divide them into ſuch as act,

1. Mechanically,

2. Chemically upon worms; and,

3. Into thoſe which poſſeſs a power compoſed of chemical and mechanical qualities.

1. The mechanical medicines act indirectly and directly upon the worms.

Thoſe which act *indirectly* are, vomits, purges, bitter and aſtringent ſubſtances, particularly aloes, rhubarb, bark, bear's-foot, and worm-ſeed. Sweet-oil acts indirectly and very feebly upon worms. It was introduced into medicine from its efficacy in deſtroying the botts in horſes; but the worms which infeſt the human bowels, are of a different nature, and poſſeſs very different organs of life from thoſe which are found in the ſtomach of an horſe.

Thoſe mechanical medicines which act *directly* upon the worms, are, cowhage * and powder of tin. The laſt of theſe medicines has been ſuppoſed to act chemically upon the worms, from the arſenic which adheres to it; but from the length of time a worm lived in a ſolution of white arſenic, it is probable the tin acts altogether mechanically upon them.

2. The medicines which act chemically upon worms, appear, from our experiments, to be very numerous.

Nature has wiſely guarded children againſt the morbid effects of worms, by implanting in them an early appetite for common ſalt, ripe fruits and ſaccharine ſubſtances; all of which appear to be among the moſt ſpeedy and effectual poiſons for worms.

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* Dolichos Pruriens, of Linnæus.

Let it not be ſaid, that nature here counteracts her own purpoſes. Her conduct in this buſineſs is conformable to many of her operations in the human body, as well as throughout all her works. The bile is a neceſſary part of the animal fluids, and yet an appetite for ripe fruits ſeems to be implanted chiefly to obviate the conſequences of its exceſs, or acrimony, in the ſummer and autumnal months.

The uſe of common ſalt as an anthelmintic medicine, is both ancient and univerſal. Celſus recommends it. In Ireland it is a common practice to feed children, who are afflicted by worms, for a week or two upon a ſalt-ſea weed, and when the bowels are well charged with it, to give a purge of wort in order to carry off the worms, after they are debilitated by the ſalt diet.

I have adminiſtered many pounds of common ſalt coloured with cochineal, in doſes of half a drachm, upon an empty ſtomach in the morning, with great ſucceſs in deſtroying worms.

Ever ſince I obſerved the effects of ſugar and other ſweet ſubſtances upon worms, I have recommended the liberal uſe of all of them in the diet of children, with the happieſt effects. The ſweet ſubſtances probably act in preventing the diſeaſes from worms in the ſtomach only, into which they often inſinuate themſelves, eſpecially in the morning. When we wiſh to diſlodge worms from the bowels by ſugar or melaſſes, we muſt give theſe ſubſtances in large quantities, ſo that they may eſcape in part the action of the ſtomach upon them.

I can ſay nothing from my own experience of the efficacy of the mineral ſalts, compoſed of copper, iron and zinc, combined with vitriolic acid, in deſtroying worms in the bowels. Nor have I ever uſed the corroſive ſublimate in ſmall doſes as an anthelmintic.

I have heard well-atteſted caſes of the efficacy of the oil of turpentine in deſtroying worms.

The expreſſed juices of onions and of garlic are very common remedies for worms. From one of the experiments it appears that the onion juice poſſeſſes ſtrong anthelmintic virtues.

I have often preſcribed a tea-ſpoonful of gunpowder in the morning upon an empty ſtomach, with obvious advantage. The active medicine here is probably the nitre.

I have found a ſyrup made of the bark of the Jamaica cabbage-tree*, to be a powerful as well as a moſt agreeable anthelmintic medicine. It ſometimes purges and vomits, but its good effects may be obtained without giving it in ſuch doſes as to produce theſe evacuations.

There is not a more *certain* anthelmintic than Carolina pink-root †. But as there have been inſtances of death having followed exceſſive doſes of it, imprudently adminiſtered; and as children are often affected by giddineſs, ſtupor, and a redneſs and pain in the eyes, after taking it, I acknowlekge that I have generally preferred to it, leſs certain, but more ſafe medicines for deſtroying worms.

3. Of the medicines whoſe action is compounded of mechanical and chemical qualities, calomel, jalap, and the powder of ſteel, are the principal.

Calomel, in order to be effectual, muſt be given in large doſes. It is a ſafe and powerful anthelmintic.

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* Geoffrea, of Linnæus.

† Spigelia Marylandica, of Linnæus.

mintic. Combined with jalap, it often brings away worms when given for other purpoſes.

Of all the medicines that I have adminiſtered, I know of none more ſafe and certain than the ſimple preparations of iron, whether they be given in the form of ſteel-filings or of the ruſt of iron. If ever they fail of ſucceſs, it is becauſe they are given in too ſmall doſes. I generally preſcribe from five, to thirty grains every morning, to children between one year, and ten years old; and I have been taught by an old ſea-captain, who was cured of a tænia by this medicine, to give from two drachms to half an ounce of it, every morning, for three or four days, not only with ſafety, but with ſucceſs.

I ſhall conclude this eſſay with the following remarks.

1. Where the action of medicines upon worms in the bowels does not agree exactly with their action upon the earth-worms in the experiments that have been related, it muſt be aſcribed to the medicines being more or leſs altered by the action of the ſtomach upon them. I conceive that the ſuperior anthelmintic qualities of Pink-root, ſteel-filings and calomel (all of which acted but ſlowly

upon the earth-worms compared with many other ſubſtances) are in a great degree occaſioned by their eſcaping the digeſtive powers unchanged, and acting in a concentrated ſtate upon the worms.

2. In fevers attended with anomalous ſymptoms, which are ſuppoſed to ariſe from worms, I have conſtantly refuſed to yield to the ſolicitations of my patients, to abandon the indications of cure in the fever, and to purſue worms as the *principal* cauſe of the diſeaſe. While I have adhered ſteadily to the uſual remedies for the different genera and ſpecies of fever, in all their ſtages, I have at the ſame time blended thoſe remedies occaſionally with anthelmintic medicines. In this I have imitated the practice of phyſicians in many other diſeaſes; in which troubleſome and dangerous ſymptoms are purſued, without ſeducing the attention from the original diſorder.

# AN
# ACCOUNT
# OF THE
# EXTERNAL USE OF ARSENIC
# IN THE
# *Cure of Cancers.*

Read before the American Philoſophical Society,
February 3, 1786.

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A FEW years ago, a certain Doctor Hugh Martin, a ſurgeon of one of the Pennſylvania regiments ſtationed at Pittſburg, during the latter part of the late war, came to this city, and advertiſed to cure cancers with a medicine which he ſaid he had diſcovered in the woods, in the neighbourhood of the garriſon. As Dr. Martin had once been my pupil, I took the liberty of waiting upon him, and aſked him ſome queſtions reſpecting his diſcovery. His anſwers were calculated to make me believe, that his medicine was of a vegetable nature, and that it was originally an Indian remedy. He ſhewed me ſome of the medicine, which appeared to be the powder of a well dried root of ſome kind. Anxious to ſee the ſucceſs of this medicine in cancerous ſores, I prevailed upon the doctor to admit me to ſee him apply it in two or three caſes. I obſerved in ſome inſtances, he applied a powder to the parts affected, and in others only touched them with a feather dipped in a liquid which had a white ſediment, and which he made me believe was the vegetable root diffuſed in water. It gave me great pleaſure to witneſs the efficacy of the doctor's applications. In ſeveral cancerous ulcers the cures he performed were complete. Where the cancers were much connected with the lymphatic ſyſtem, or accompanied with a ſcrophulous habit of body, his medicine always failed, and, in ſome inſtances, did evident miſchief.

Anxious to diſcover a medicine that promiſed relief in even a few caſes of cancers, and ſuppoſing that all the cauſtic vegetables were nearly alike, I applied the phytolacca or poke-root, the ſtramonium, the arum, and one or two others, to foul ulcers, in hopes of ſeeing the ſame effects from them which I had ſeen from Doctor Martin's powder; but in theſe I was diſappointed.

They gave ſome pain, but performed no cures. At length I was furniſhed by a gentleman from Pittſburgh with a powder which I had no doubt, from a variety of circumſtances, was of the ſame kind as that uſed by Doctor Martin. I applied it to a fungous ulcer, but without producing the degrees of pain, inflammation, or diſcharge, which I had been accuſtomed to ſee from the application of Doctor Martin's powder. After this, I ſhould have ſuſpected that the powder was not a *ſimple* root, had not the doctor continued upon all occaſions to aſſure me, that it was wholly a vegetable preparation.

In the beginning of the year 1784, the doctor died, and it was generally believed that his medicine had died with him. A few weeks after his death I procured, from one of his adminiſtrators, a few ounces of the doctor's powder, partly with a view of applying it to a cancerous ſore which then offered, and partly with a view of examining it more minutely than I had been able to do during the doctor's life. Upon throwing the powder, which was of a brown colour, upon a piece of white paper, I perceived diſtinctly a number of white particles ſcattered through it. I ſuſpected at firſt that they were corroſive ſublimate, but the uſual teſts of that metallic ſalt ſoon convinced me

that

that I was miſtaken. Recollecting that arſenic was the baſis of moſt of the celebrated cancer powders that have been uſed in the world, I had recourſe to the teſts for detecting it. Upon ſprinkling a ſmall quantity of the powder upon ſome coals of fire, it emitted the garlick ſmell ſo perceptibly as to be known by ſeveral perſons whom I called into the room where I made the experiment, and who knew nothing of the object of my enquiries. After this with ſome difficulty I picked out about three or four grains of the white powder, and bound them between two pieces of copper, which I threw into the fire. After the copper pieces became red hot, I took them out of the fire, and when they had cooled, diſcovered an evident whiteneſs imparted to both of them. One of the pieces afterwards looked like dull ſilver. Theſe two teſts have generally been thought ſufficient to diſtinguiſh the preſence of arſenic in any bodies; but I made uſe of a third, which has lately been communicated to the world by Mr Bergman, and which is ſuppoſed to be in all *caſes* infallible.

I infuſed a ſmall quantity of the powder in a ſolution of a vegetable alkali in water for a few hours, and then poured it upon a ſolution of blue vitriol in water. The colour of the vitriol was immediately changed to a beautiful green, and afterwards precipitated.

I ſhall cloſe this paper with a few remarks upon this powder, and upon the cure of cancers and foul ulcers of all kinds.

1. The uſe of cauſtics in cancers and foul ulcers is very antient, and univerſal. But I believe *arſenic* to be the moſt efficacious of any that has ever been uſed. It is the baſis of Plunket's and probably of Guy's well known cancer powders. The great art of applying it ſucceſsfully, is to dilute and mix it in ſuch a manner as to mitigate the violence of its action. Doctor Martin's compoſition was happily calculated for this purpoſe. It gave leſs pain than the common or lunar cauſtic. It excited a moderate inflammation, which ſeparated the morbid from the ſound parts, and promoted a plentiful afflux of humours to the ſore during its application. It ſeldom produced an eſcar; hence it inſinuated itſelf into the deepeſt receſſes of the cancers, and frequently ſeparated thoſe fibres in an unbroken ſtate which are generally called the roots of the cancer. Upon this account, I think, in an ulcerated cancer it is to be preferred to the knife. It has no action upon the ſound ſkin. This Doctor Hall proved by confining

a ſmall quantity of it upon his arm for many hours. In thoſe caſes where Doctor Martin uſed it to extract cancerous or ſchirrous tumours that were not ulcerated, I have reaſon to believe that he always broke the ſkin with Spaniſh flies.

2. The arſenic uſed by the doctor was the pure white arſenic. I ſhould ſuppoſe from the examination I made of the powder with the eye, that the proportion of arſenic to the vegetable powder, could not be more than $\frac{1}{40}$ part of the whole compound. I have reaſon to think that the doctor employed different vegetable ſubſtances at different times. The vegetable matter with which the arſenic was combined in the powder which I uſed in my experiments, was probably nothing more than the powder of the root and berries of the ſolanum lethale, or deadly nightſhade. As the principal, and perhaps the only deſign of the vegetable addition was to blunt the activity of the arſenic, I ſhould ſuppoſe that the ſame proportion of common wheat flour as the doctor uſed of his cauſtic vegetables, would anſwer nearly the ſame purpoſe. In thoſe caſes where the Doctor applied a feather dipped in a liquid to the ſore of his patient, I have no doubt but his phial contained nothing but a weak ſolution of arſenic in water. This is no new method of applying arſenic to foul

ulcers. Doctor Way of Wilmington, has ſpoken in the higheſt terms to me of a waſh for foulneſſes on the ſkin, as well as old ulcers, prepared by boiling an ounce of white arſenic in two quarts of water to three pints, and applying it once or twice a day.

3. I mentioned, formerly, that Doctor Martin was often unſucceſsful in the application of his powder. This was occaſioned by his uſing it indiſcriminately in *all* caſes. In ſchirrous and cancerous tumours, the knife ſhould always be preferred to the cauſtic. In cancerous ulcers attended with a ſcrophulous or a bad habit of body, ſuch particularly as have their ſeat in the neck, in the breaſts of females, and in the axillary glands, it can only protract the patient's miſery. Moſt of the cancerous ſores cured by Doctor Martin were ſeated on the noſe, or cheeks, or upon the ſurface or extremities of the body. It remains yet to diſcover a cure for cancers that taint the fluids, or infect the whole lymphatic ſyſtem. This cure I apprehend muſt be ſought for in diet, or in the long uſe of ſome internal medicine.

To pronounce a diſeaſe incurable, is often to render it ſo. The intermitting fever, if left to itſelf, would probably prove frequently, and perhaps more ſpeedily fatal than cancers. And as cancerous tumours and ſores are often neglected, or treated improperly by injudicious people, from an apprehenſion that they are incurable, (to which the frequent advice of phyſicians "to let them "alone," has no doubt contributed) perhaps the introduction of arſenic into regular practice as a remedy for cancers, may invite to a more early application to phyſicians, and thereby prevent the deplorable caſes that have been mentioned, which are often rendered ſo by delay or unſkilful management.

4. It is not in cancerous ſores only that Doctor Martin's powder has been found to do ſervice. In ſores of all kinds, and from a variety of cauſes, where they have been attended with fungous fleſh or callous edges, I have uſed the doctor's powder with advantage.

I flatter myſelf that I ſhall be excuſed in giving this detail of a *quack* medicine, when the ſociety reflect that it was from the inventions and temerity of quacks, that phyſicians have derived ſome of their moſt active and moſt uſeful medicines.

# OBSERVATIONS

## ON THE

## CAUSE AND CURE

## OF THE

## *TETANUS.*

Read before the AMERICAN PHILOSOPHICAL SOCIETY,
March 17, 1786.

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DURING my attendance, as phyſician-general, upon the military hoſpitals of the United States, in the courſe of the late war, I met with ſeveral caſes of the tetanus. I had frequently met with this diſorder in private practice, and am ſorry to ſay, that I never ſucceeded with the ordinary remedy of opium in any one caſe that came under my care. I found it equally ineffectual in the army. Baffled in my expectations from a remedy that had been ſo much celebrated, I began to inveſtigate more particularly the nature of the diſorder. I found it to be a diſorder of warm climates,

mates, and warm ſeaſons. This led me to aſcribe it to relaxation. I reſolved to attempt the cure of it by medicines in ſome meaſure the oppoſites of moſt of thoſe which have been employed in that diſorder. Soon after I adopted this reſolution, I was called to viſit Col. John Stone, who was wounded through the foot at the battle of Germantown, on the 4th of October 1777. He was in the third day of a tetanus. His ſpaſms were violent, and his pains ſo exquiſite, that his cries were heard near a hundred yards from his quarters. His head was thrown a little backwards, and his jaw had become ſtiff and contracted. He was under the care of a ſkilful regimental ſurgeon, who was pouring down opium in large quantities without effect.

Duty and friendſhip both led me to do my utmoſt to ſave the life of this valuable officer. I immediately diſmiſſed the opium, and gave him large quantities of wine and bark, to the amount of two or three ounces of the latter, and from a bottle to three pints of the former in the day. In a few hours I was delighted with their effects. His ſpaſms and pains were leſs frequent and violent, and he ſlept for ſeveral hours, which he had not done for ſeveral days and nights before.

With the ſame indication in view, I applied a bliſter between his ſhoulders, and rubbed in two or three ounces of mercurial ointment upon the outſide of his throat. He continued to mend gradually under the operation of theſe medicines, ſo that in ten days he was out of danger, although the ſpaſm continued in his wounded foot for ſeveral weeks afterwards.

In the ſummer of the year 1782, I was called to viſit a ſervant girl of Mr. Alexander Todd, merchant of this city, who had brought on a tetanus by ſleeping in the evening on a damp brick pavement, after a day in which the mercury in Farenheit's thermometer had ſtood at near 90°. The caſe was nearly as violent and alarming as the one I have deſcribed. I treated her in the ſame manner, and with the ſame ſucceſs. To the above named medicines, I added only the oil of amber, which ſhe took in large doſes, after I ſuſpected the tonic and ſtimulating powers of the bark and wine began to loſe their effects. The good effects of the oil were very obvious. She recovered gradually, and has continued ever ſince in good health.

In the ſummer of the ſame year, I was called to Alexander Leſlie, a joiner who had run a nail into his foot. I found him the day afterwards in extreme pain, with ſmall convulſions, and now and then a twinge in his jaw. The wound in his foot was without ſwelling or inflammation. I dilated the wound and filled it with lint moiſtened with ſpirit of turpentine. This in a little while produced a good deal of pain and a great inflammation in his foot. While I was preparing to treat him in the manner I had treated the two former caſes, the pains and ſpaſms in his body ſuddenly left him, and in twenty-four hours after I ſaw him, he complained of nothing but of the pain and ſwelling in his foot, which continued for ſeveral weeks, and did not leave him till it ended in a ſuppuration. From the hiſtory of theſe three caſes, I beg leave to make the following remarks:

1. That the prediſpoſition to the tetanus depends upon a relaxation of the muſcular part of the nervous ſyſtem. This relaxation is generally produced by heat; but exceſſive labour, watchings, marches, or fatigue from any cauſe, all produce it likewiſe; and hence we find it more frequent from wounds received in battles, than from ſimilar wounds received in any other way. Theſe wounds more certainly produce the tetanus, if they have been preceded for ſome time with warm weather. Doctor Shoepſt, the phyſician-general of the An-

ſpach troops who ſerved at the ſiege of York in the year 1781, informed me of a ſingular fact upon this ſubject. Upon converſing with the French ſurgeons after the capitulation, he was informed by them that the troops who arrived juſt before the ſiege from the Weſt Indies with Count de Graſſe, were the only troops belonging to their nation who ſuffered from the tetanus. There was not a ſingle inſtance of that diſorder among the French troops who had ſpent a winter in Rhode-Iſland.

2. As the tetanus ſeems to be occaſioned by relaxation, the medicines indicated to cure it are ſuch only as are calculated to remove this relaxation, and to reſtore tone to the muſcular ſyſtem. The bark, wine, and bliſters, appear to act in this way. But I will go one ſtep further. In order to cure this diſorder, it is neceſſary not only to produce an ordinary tone, but a moderate degree of inflammatory diatheſis in the arterial ſyſtem. The abſence of this diatheſis is taken notice of by all authors, particularly by Doctor Cullen *.

Mercury appears to act only by promoting this diatheſis. Hence it never does any ſervice unleſs

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* Firſt Lines, Vol. III.

it be given time enough to produce a ſalivation. The irritation and inflammation produced in the mouth and throat, ſeldom fail to produce the inflammatory diatheſis, as blood drawn in a ſalivation has repeatedly ſhewn.

I apprehend that the oil of amber acts as a ſtimulant chiefly in this diſorder. I have heard of a tetanus being cured in the iſland of Grenada by large doſes of muſtard. Doctor Wright, lately of the iſland of Jamaica, relates in the ſixth volume of the London medical eſſays, ſeveral remarkable caſes of the tetanus being cured by the cold bath. Both theſe remedies certainly act as ſtimulants and tonics. By reaſoning *à priori*, I conceive that electricity would be found to be an equally powerful remedy in this diſorder.

As a general inflammatory diatheſis diſpoſes to topical inflammation, ſo topical inflammation diſpoſes to general inflammatory diatheſis. Wounds upon this account are leſs apt to inflame in ſummer than in winter. In the tetanus, I have uniformly obſerved an abſence of all inflammation in the wounds or injuries which produced it. Doctor Stoll of Vienna has made the ſame obſervation*.

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* Pars tertia, Rationis Medendi, p. 423.

A ſplinter under the nail produces no convulſions, if pain, inflammation or ſuppuration follow the accident. It is by exciting pain and inflammation, I apprehend, that the ſpirit of turpentine acts in all wounds and punctures of nervous and tendinous parts. I have never known a ſingle inſtance of a tetanus from a wound, where this remedy had been applied in time. It was to excite an inflammation in the foot of Mr. Leſlie, that I dilated the wound and filled it with the ſpirit of turpentine. I was not ſurpriſed at its good effects in this caſe, for I was prepared to expect them.

I find a remarkable caſe related in Doctor W. Monro's Theſis, publiſhed in Edinburgh in the year 1783, of a black girl, who had a tetanus from running a nail in her foot, being perfectly cured by deep and extenſive inciſions made in the wounded part by Doctor John Bell, of the iſland of Grenada.

It is by producing inflammation in a particular part, and tone in the whole ſyſtem, I apprehend, that the amputation of a wounded limb ſometimes cures a tetanus; and it is becauſe the degrees of both are too inconſiderable to oppoſe the violence of the ſpaſms in the advanced ſtages of the tetanus, that amputation often fails of ſucceſs.

I have been informed by a phyſician who reſided ſome time at St. Croix, that the negroes on that iſland always apply a plaſter made of equal parts of ſalt and tallow to their freſh wounds, in order to prevent a locked jaw. The ſalt always produces ſome degree of inflammation.

However neceſſary a certain degree of inflammatory diatheſis may be to impart a tone to the muſcles, there is ſometimes ſuch an *exceſs* in this diatheſis, as to diſpoſe to ſpaſmodic or convulſive motions. A caſe of tetanus from this cauſe was communicated to me in a letter dated April 18th 1792, by my learned and ingenious correſpondent Dr. Hopkins of Connecticut, and I have lately met with a caſe of the ſame kind in the "Journal de Medecine" for September 1773, by M. Molmy. They both yielded to blood-letting, after the moſt powerful ſtimulants had been uſed to no purpoſe.

If the facts that have been ſtated be true, and the inferences that have been drawn from them be juſt, how ſhall we account for the action of the opium in curing this diſorder? I do not deny its good effects in many caſes, but I believe it has failed in four caſes out of five in the hands of moſt practitioners. It is remarkable that it ſucceeds only where it is given in very large doſes. In theſe caſes I would ſuppoſe that it acts only as a ſtimulant. It is upon a footing, therefore, with the ſtimulating medicines that have been mentioned; but from its being of a more diffuſible nature, it is probably inferior to moſt of them. I am the more inclined to adopt this opinion, from an account I once received from Doctor Robert, of the iſland of Dominique, who informed me, that after having cured a negro man of a tetanus with large doſes of opium, he was afterwards ſeized with a diſorder in his ſtomach, of which he died in a few days. Upon opening him, he found his ſtomach inflamed and mortified. I do not forbid the uſe of opium in this diſorder. I think ſmall doſes of it may be given to eaſe pain, as in other ſpaſmodic diſorders; but as a radical remedy, I think it ought to yield to ſtimulants of a more durable nature.

To the caſes that have been mentioned, I could add many others, in which I have reaſon to believe that the excitement of a topical inflammation by artificial means, has effectually prevented a tetanus.

To this account of the tetanus, I beg leave to ſubjoin a few words upon a diſorder commonly called the jaw-fall in infants, or the triſmus naſcentium of Doctor Cullen, which is nothing but a ſpecies of tetanus.

I have met with three caſes of it in this city, all of which proved fatal. The ſtage of the diſorder in which I was conſulted, and the age and weakneſs of the infants, forbad me to attempt any thing for their relief. I have introduced the ſubject of this diſorder in children, only for the ſake of mentioning a fact communicated to me by the late Doctor Cadwallader Evans of this city. This gentleman practiſed phyſic for ſeveral years in Jamaica, where he had frequent opportunities of ſeeing the tetanus in the black children. He found it in every caſe to be incurable. He ſuppoſed it to be connected with the retention of the meconium in in the bowels. This led him invariably to purge every child that was born upon the eſtates committed to his care. After he adopted this practice, he never met with a ſingle inſtance of the tetanus among children.

Perhaps it may tend to enlarge our ideas of the tetanus, and to promote a ſpirit of inquiry and experiment, to add, that this diſorder is not confined to the human ſpecies. I have known ſeveral inſtances of it in horſes, from nails running in their feet, and other accidents. It is attended with a rigidity of the muſcles of the neck, a ſtiffneſs in the limbs, and ſuch a contraction of the jaw as to prevent their eating. It is generally fatal. In two caſes I had the the pleaſure of ſeeing the diſeaſe perfectly cured by applying a potential cauſtic to the neck under the mane, by large doſes of oil of amber, and by plunging one of them into the river, and throwing buckets of cold water upon the other.

How far the reaſonings contained in this paper may apply to the hydrophobia, I cannot determine, having had no opportunity of ſeeing the diſeaſe ſince I adopted theſe principles; but from the ſpaſmodic nature of the diſorder, from the ſeaſon of the year in which it generally occurs, and above all, from the caſe related by Doctor Fothergill, of a young woman having eſcaped the effects of the bite of a mad cat by means of the wound being kept open, (which from its ſeverity was probably connected with ſome degrees of inflammation) is it not probable that the ſame remedies, which have been uſed with ſucceſs in the tetanus, may be uſed with advantage in the hydrophobia? In a diſeaſe ſo deplorable, and hitherto ſo unſucceſsfully treated even a conjecture may lead to uſeful experiments and inquiries.

# ADDITIONAL OBSERVATIONS

## UPON THE

## *Tetanus and Hydrophobia.*

SINCE the publication of the foregoing obſervations, in the ſecond volume of the American Philoſophical Tranſactions, I have received letters from ſeveral phyſicians in the United States, and in the Weſt Indies*, and one from Doctor James Currie of Liverpool, in Great Britain; in each of which are contained caſes that confirm the efficacy of tonic remedies, more eſpecially of *wine* and the *cold bath*, in the cure of tetanus. My own experience has furniſhed ſeveral caſes, in addition to thoſe which are publiſhed, in favour of the firſt of thoſe remedies, joined with mercury. I am, notwithſtanding, obliged to own, that the method of cure above-mentioned has failed, in ſome inſtances, in the hands of ſeveral reſpectable practitioners in Philadelphia; but I have reaſon to believe it was only where it was not uſed in the firſt ſtage, of the diſorder, or where every poſſible advantage has not been taken of the combined powers of all the tonic remedies that have been mentioned, or where ſuch a regard has not been had to the ſtate of the pulſe, as to aſſiſt thoſe remedies, by moderate blood-letting.

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* Viz. Dr. Conyngham of Virginia, Dr. Shaeff, and Dr. Stocket of Maryland, Dr Campbell of New Jerſey, Dr. Betton, and Dr. Broadbelt of Jamaica, and Dr. Alexander Anderſon of the Iſland of St. Vincents.

The Rev. Dr. Henry Muhlenberg, principal of the German college in Lancaſter, informed me in the month of June 1787, that he had often met with the triſmus naſcentium among the children of poor people belonging to his congregation. After reading the account of Doctor Evans's ſucceſsful method of preventing that diſorder in Jamaica, by means of gentle purges, he recommended that practice to the parents of children, where he ſuſpected the diſeaſe might take place, and always with ſucceſs.

The more I have conſidered the cauſes and ſymptoms of hydrophobia, the more I am diſpoſed to aſcribe it to the ſame proximate cauſe as the tetanus. 1. They both affect the muſcles of deglutition. I have lately ſeen a tetanus brought on by a fractured leg, in which an attempt to ſwallow the ſmalleſt quantity of any liquid, produced the ſame ſudden and general convulſions which occur in the hydrophobia. 2. They both proceed from cauſes which appear to be related to each other, viz. from wounds, and from the action of cold after the body has been previouſly weakened by heat and exerciſe. Of the laſt, we have a remarkable proof in an account of a ſpontaneous hydrophobia, publiſhed by Mr. Arthaud, preſident of the circle of Philadelphians at Cape Francois, in the firſt volume of the tranſactions * of that new and enterprizing ſociety. 3. They both ſometimes appear as ſymptoms of the ſame idiopathic diſorder, viz. the hyſteria. 4. They both yield to the ſame remedies, viz. to the excitement of an inflammation in the wounded part of the body, or to a long continued diſcharge of matter from it, and to mercury. Of the efficacy of each of theſe remedies, there are proofs, not only in Mr. Arthaud's obſervations upon the hydrophobia, before mentioned, but in Vanſwieten's commentaries upon Boerhaave's aphoriſms †.

To theſe facts I ſhall add one more, which may ſerve ſtill further to eſtabliſh the ſameneſs of the indi-

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* Recherches, Memoires, et Obſervations ſur les Maladies Epizootiques, de Saint Domingue, p. 220.

† Aphoriſm 1143, No. 1.

indications of cure in the tetanus and hydrophobia. In the London medical journal for the months of April, May, and June, 1784, I find the following account publiſhed by Doctor De Mathiis, phyſician to the king of Naples' army. "During his "reſidence in Calabria, (the doctor tells us) that "having one day caught a viper in the fields, he "had occaſion in his way home to paſs by a farm-"yard, where he ſaw a dog chained that was ſaid "to be mad. He offered water to this dog, upon "which he immediately fell into convulſions. Re-"collecting his viper, he was tempted to try its "effects by applying it to the dog's throat. This "was accordingly done, and the conſequences "were, the head of the dog ſwelled, the ſymp-"toms of the hydrophobia ceaſed, and the animal "recovered."

If more facts ſhould occur, which ſhall ſhew the relation that the tetanus and hydrophobia have to each other, perhaps we may be led to conclude, that the wound inflicted by the teeth of a dog ſometimes acts in the ſame manner in producing hydrophobia, that wounds made by a nail, or any obtuſe lacerating inſtrument act, in producing tetanus; and that both diſeaſes may be prevented, or cured, with equal certainty by the ſame tonic remedies.

# THE RESULT OF OBSERVATIONS MADE UPON THE DISEASES WHICH OCCURRED IN THE *Military Hoſpitals of the United States*, DURING THE LATE WAR.

1. THE army when it lay in tents was always more ſickly, than when it lay in the open air. It was likewiſe more healthy when it was kept in motion, than when it lay in an encampment.

2. Young men under twenty years of age were ſubject to the greateſt number of camp diſeaſes.

3. The ſouthern troops were more ſickly than the northern or eaſtern troops.

4. The native Americans were more ſickly than the natives of Europe who ſerved in the American army.

5. Men above thirty, and five and thirty years of age, were the hardieſt ſoldiers in the army. Perhaps the reaſon why the natives of Europe were more healthy than native Americans, was, they were more advanced in life.

6. The ſouthern troops ſickened from the want of ſalt proviſions. Their ſtrength and ſpirits were reſtored only by means of ſalted meat. I once ſaw a private in a Virginia regiment, throw away his ration of choice freſh beef, and give a dollar for a pound of ſalted bacon.

7. Thoſe officers who wore flannel ſhirts or waiſtcoats next to their ſkins, in general eſcaped fevers and diſeaſes of all kinds.

8. The principal diſeaſes in the hoſpitals were the typhus gravior and mitior of Doctor Cullen. Men who came into the hoſpitals with pleuriſies or rheumatiſms, ſoon loſt the types of their original diſeaſes, and ſuffered, or died, by the abovementioned fever.

9. This fever always prevailed moſt, and with the worſt ſymptoms in winter. A free air, which could only be obtained in ſummer, always prevented, or mitigated it.

10. In all thoſe caſes, where the contagion was received, cold ſeldom failed to render it active. Whenever an hoſpital was removed in winter, one half of the patients generally ſickened on the way, or ſoon after their arrival at the place to which they were ſent.

11. Drunken ſoldiers and convaleſcents were moſt ſubject to this fever.

12. Thoſe patients in this fever who had large ulcers on their back or limbs, generally recovered.

13. I met with ſeveral inſtances of buboes, alſo of ulcers in the throat, as deſcribed by Doctor Donald Monro. They were miſtaken by ſome of the junior ſurgeons for venereal ſores, but they yielded to the common remedies of the hoſpital fever.

14. There were many inſtances of patients in this fever, who ſuddenly fell down dead, upon being moved, without any previous ſymptoms of approaching diſſolution. This was more eſpecially the caſe, when they aroſe to go to ſtool.

15. The contagion of this fever was frequently conveyed from the hoſpital to the camp, by means of blankets and clothes.

16. Thoſe black ſoldiers who had been previouſly ſlaves, died in a greater proportion by this fever, or had a much ſlower recovery from it, than the ſame number of white ſoldiers.

17. The remedies which appeared to do moſt ſervice in this diſorder were vomits of tartar emetic, gentle doſes of laxative ſalts, bark, wine, volatile ſalt, opium, and bliſters.

18. An emetic ſeldom failed of checking this fever if exhibited while it was in a *forming* ſtate, and before the patient was confined to his bed.

19. Many cauſes concurred to produce, and increaſe this fever; ſuch as the want of cleanlineſs, exceſſive fatigue, the ignorance or negligence of officers in providing ſuitable diet and accommodations for their men, the general uſe of linen inſtead of woollen clothes in the ſummer months, and the crouding too many patients together in one hoſpital, with ſuch other inconveniences and abuſes, as uſually follow the union of of the *pur-*

*veying* and *directing* departments of hoſpitals in the *ſame* perſons. But there is one more cauſe of this fever which remains to be mentioned, and that is, the ſudden aſſembling of a great number of perſons together of different habits and manners, ſuch as the ſoldiers of the American army were in the year 1776 and 1777. Doctor Blane informs us, in his obſervations upon the diſeaſes of ſeamen, "that it ſometimes happens that a ſhip with a "long eſtabliſhed crew ſhall be very *healthy*, yet "if ſtrangers are introduced among them, who "are alſo *healthy*, ſickneſs will be mutually pro-"duced." The hiſtory of diſeaſes furniſhes many proofs of the truth of this aſſertion*. It is very remarkable, that while the American army at Cambridge in the year 1775, conſiſted only of New-Englandmen (whoſe habits and manners were the ſame) there was ſcarcely any ſickneſs among them. It was not till the troops of the eaſtern, middle and ſouthern ſtates met at New-York and

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* "Cleanlineſs is founded on a natural averſion to what is unſeemly and offenſive in the perſons of others; and there ſeems alſo to be an inſtinctive horror at ſtrangers implanted in human nature for the ſame purpoſe, as is viſible in young children, and uncultivated people. In the early ages of Rome, the ſame word ſignified both a ſtranger and an enemy." Dr. Blane, p. 225.

Ticonderoga in the year 1776, that the typhus became univerſal, and ſpread with ſuch peculiar mortality in the armies of the United States.

20. The dyſentery prevailed in the ſummer of 1777 in the military hoſpitals in New-Jerſey, but with very few inſtances of mortality. This dyſentery was frequently followed by an obſtinate diarrhœa, in which the warm bath was found in many caſes to be an effectual remedy.

21. I ſaw ſeveral inſtances of fevers occaſioned by the uſe of the common ointment made of the flour of ſulphur and hogs lard for the cure of the itch. The fevers were probably brought on by the expoſure of the body to the cold air, in the uſual method in which that ointment is aplied. I have ſince learned, that the itch may be cured as ſpeedily by rubbing the parts affected, two or three times with the dry flour of ſulphur, and that no inconvenience and ſcarcely any ſmell, follow this mode of uſing it.

22. In gun-ſhot wounds of the joints, Mr. Ranby's advice of amputating the limb was followed by ſucceſs. I ſaw two caſes of death where this advice was neglected.

23. There was one inſtance of a ſoldier who loſt his hearing, and another of a ſoldier who had been deaf who recovered his hearing, by the noiſe of artillery in a battle.

24. Thoſe ſoldiers who were biletted in private houſes, generally eſcaped the contagion of the hoſpital fever, and recovered ſooneſt from all their diſeaſes.

25. Hoſpitals built of coarſe logs, with *ground* floors, with fire-places in the middle of them, and a hole in the roof, for the diſcharge of ſmoke, were found to be very conducive to the recovery of the ſoldiers from the jail fever. This form of a military hoſpital was introduced into the army by Dr. Tilton of the ſtate of Delaware.

26. In fevers and dyſenteries, thoſe ſoldiers recovered moſt certainly, and moſt ſpeedily, who lay at the greateſt diſtance from the walls of the hoſpitals. This important fact was communicated to me by the late Dr. Beardſley of Connecticut.

27. Soldiers are but little more than adult children. That officer, therefore, will beſt perform his duty to his men, who obliges them to take the moſt care of their HEALTH.

28. Hoſpitals are the ſinks of human life in an army. They robbed the United States of more citizens than the ſword. Humanity, œconomy, and philoſophy, all concur in giving a preference to the conveniences and wholeſome air of private houſes; and ſhould war continue to be the abſurd and unchriſtian mode of deciding national diſputes, it is to be hoped that the progreſs of ſcience will ſo far mitigate one of its greateſt calamities, as to produce an abolition of hoſpitals for acute diſeaſes. Perhaps there are no caſes of ſickneſs in which reaſon and religion do not forbid the ſecluſion of our fellow-creatures from the offices of humanity in private families, except where they labour under the calamities of madneſs and the venereal diſeaſe, or where they are the ſubjects of ſome of the operations of ſurgery.

# AN ACCOUNT OF THE INFLUENCE OF THE MILITARY AND POLITICAL EVENTS OF THE AMERICAN REVOLUTION UPON THE HUMAN BODY.

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THERE were ſeveral circumſtances peculiar to the American revolution, which ſhould be mentioned previouſly to an account of the influence of the events which accompanied it, upon the human body.

1. The revolution intereſted every inhabitant of the country of both ſexes, and of every rank and age that was capable of reflection. An indifferent, or neutral ſpectator of the controverſy, was ſcarcely to be found in any of the ſtates.

2. The ſcenes of war and government which it introduced, were new to the greateſt part of the inhabitants of the United States, and operated with all the force of *novelty* upon the human mind.

3. The controverſy was conceived to be the moſt important of any that had ever engaged the attention of mankind. It was generally believed by the friends of the revolution, that the very exiſtence of *freedom* upon our globe, was involved in the iſſue of the conteſt in favour of the United States.

4. The American revolution included in it the cares of government, as well as the toils and dangers of war. The American mind was, therefore, frequently occupied at the *ſame time*, by the difficult and complicated duties of political and military life.

5. The revolution was conducted by men who had been born *free*, and whoſe ſenſe of the bleſſings of liberty was of courſe more exquiſite than if they had juſt emerged from a ſtate of ſlavery.

6. The greateſt part of the ſoldiers in the armies of the United States had family connections and property in the country.

7. The war was carried on by the Americans againſt a nation, to whom they had long been tied by the numerous obligations of conſanguinity, laws, religion, commerce, language, intereſt, and a mutual ſenſe of national glory. The reſentments of the Americans of courſe roſe, as is uſual in all diſputes, in proportion to the number and force of theſe ancient bonds of affection and union.

8. A predilection to a limited monarchy, as an eſſential part of a free and ſafe government, and an attachment to the reigning king of Great-Britain, (with a very few exceptions) were univerſal in every part of the United States.

9. There was at one time a ſudden diſſolution of civil government in *all*, and of eccleſiaſtical eſtabliſhments in ſeveral of the ſtates.

10. The expences of the war were ſupported by means of a paper currency, which was continually depreciating.

From the action of each of theſe cauſes, and frequently from their combination in the ſame perſons, effects might reaſonably be expected, both upon the mind and body, which have ſeldom occurred;

curred; or if they have, I believe were never fully recorded in any age or country

It might afford ſome uſeful inſtruction, to point out the influence of the military and political events of the revolution upon the underſtandings, paſſions, and morals of the citizens of the United States; but my buſineſs in the preſent inquiry, is only to take notice of the influence of theſe events upon the human body, through the medium of the mind.

I ſhall firſt mention the effects of the military, and ſecondly, of the political events of the revolution. The laſt muſt be conſidered in a two-fold view, accordingly as they affected the friends or the enemies of the revolution.

I. In treating of the effects of the military events, I ſhall take notice, firſt, of the influence of *actual* war, and, ſecondly, of the influence of the military life.

In the beginning of a battle, I have obſerved *thirſt* to be a very common ſenſation among both officers and ſoldiers. It occurred where no exerciſe, or action of the body, could have excited it.

Many officers have informed me, that after the firſt onſet in a battle, they felt a glow of heat, ſo univerſal as to be perceptible in both their ears. This was the caſe in a particular manner, in the battle of Princeton, on the third of January in the year 1777, on which day the weather was remarkably cold.

A veteran colonel of a New-England regiment, whom I viſited at Princeton, and who was wounded in the hand at the battle of Monmouth, on the 28th of June, 1778, (a day in which the mercury ſtood at 90° of Farenheit's thermometer) after deſcribing his ſituation at the time he received his wound, concluded his ſtory by remarking, that "fighting was hot work on a cold day, but much "more ſo on a warm day." The many inſtances which appeared after that memorable battle, of ſoldiers who were found among the ſlain without any marks of wounds or violence upon their bodies, were probably occaſioned by the heat excited in the body by the emotions of the mind, being added to that of the atmoſphere.

Soldiers bore operations of every kind immediately *after* a battle, with much more fortitude than they did at any time afterwards.

The effects of the military life upon the human body come next to be conſidered under this head.

In another place * I have mentioned three caſes of pulmonary conſumption being perfectly cured by the diet and hardſhips of a camp life.

Doctor Blane, in his valuable obſervations on the diſeaſes incident to ſeamen, aſcribes the extraordinary healthineſs of the Britiſh fleet in the month of April 1782, to the effects produced on the ſpirit of the ſoldiers and ſeamen, by the victory obtained over the French fleet on the 12th of that month; and relates, upon the authority of Mr. Ives, an inſtance in the war between Great-Britain and the combined powers of France and Spain in 1744, in which the ſcurvy, as well as other diſeaſes, were checked by the proſpect of a naval engagement.

The American army furniſhed an inſtance of the effects of victory upon the human mind, which may ſerve to eſtabliſh the inferences from the facts related by Doctor Blane. The Philadelphia militia who joined the remains of General Waſhington's army, in December 1776, and ſhared with

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* Page 201.

them a few days afterwards in the capture of a large body of Heſſians at Trenton, conſiſted of 1500 men, moſt of whom had been accuſtomed to the habits of a city life. Theſe men ſlept in tents and barns, and ſometimes in the open air during the uſual colds of December and January; and yet there were only two inſtances of ſickneſs, and only one of death, in that body of men in the courſe of nearly ſix weeks, in thoſe winter months. This extraordiny healthineſs of ſo great a number of men under ſuch trying circumſtances, can only be aſcribed to the vigour infuſed into the human body by the victory of Trenton having produced inſenſibility to all the uſual remote cauſes of diſeaſes.

Militia officers and ſoldiers, who enjoyed good health during a campaign, were often affected by fevers and other diſorders, as ſoon as they returned to their reſpective homes. I knew one inſtance of a militia captain, who was ſeized with convulſions the firſt night he lay on a feather bed, after ſleeping ſeveral months on a mattraſs, or upon the ground. Theſe affections of the body appeared to be produced only by the ſudden abſtraction of that tone in the ſyſtem which was excited by a ſenſe of danger, and the other invigorating objects of a military life.

The NOSTALGIA of Doctor Cullen, or the *home-ſickneſs*, was a frequent diſeaſe in the American army, more eſpecially among the ſoldiers of the New-England ſtates. But this diſeaſe was ſuſpended by the ſuperior action of the mind under the influence of the principles which governed common ſoldiers in the American army. Of this General Gates furniſhed me with a remarkable inſtance in 1776, ſoon after his return from the command of a large body of regular troops and militia at Ticonderoga. From the effects of the noſtalgia, and the feebleneſs of the diſcipline, which was exerciſed over the militia, deſertions were very frequent and numerous in his army, in the latter part of the campaign; and yet during the *three weeks* in which the general expected every hour an attack to be made upon him by General Burgoyne, there was not a ſingle deſertion from his army, which conſiſted at that time of 10,000 men.

The patience, firmneſs, and magnanimity with which the officers and ſoldiers of the American army endured the complicated evils of hunger, cold, and nakedneſs, can only be aſcribed to an inſenſibility of body produced by an uncommon tone of mind excited by the love of liberty and their country.

Before I proceed to the ſecond general diviſion of this ſubject, I ſhall take notice, that more inſtances of apoplexies occurred in the city of Philadelphia, in the winter of 1774-5, than had been known in former years. I ſhould have heſitated in recording this fact, had I not found the obſervation ſupported by a fact of the ſame kind, and produced by a nearly ſimilar cauſe, in the appendix to the practical works of Doctor Baglivi, profeſſor of phyſic and anatomy at Rome. After a very wet ſeaſon in the winter of 1694-5, he informs us, that "apoplexies diſplayed their rage; and "perhaps (adds our author) that ſome part of "this epidemic illneſs was owing to the univerſal "grief and domeſtic care, occaſioned by all Europe "being engaged in a war. All commerce was "diſturbed, and all the avenues of peace blocked "up, ſo that the ſtrongeſt heart could ſcarcely bear "the thoughts of it." The winter of 1774-5, was a period of uncommon anxiety among the citizens of America. Every countenance wore the marks of painful ſolicitude, for the event of a petition to the throne of Britain, which was to determine whether reconciliation, or a civil war, with all its terrible and diſtreſſing conſequences, were to take place. The apoplectic fit, which deprived the world of the talents and virtues of Peyton Randolph, while he filled the chair of Congreſs in 1775, appeared to be occaſioned in part by the preſſure of the uncertainty of thoſe great events upon his mind. To the name of this illuſtrious patriot, ſeveral others might be added, who were affected by the apoplexy in the ſame memorable year. At this time a difference of opinion upon the ſubject of the conteſt with Great-Britain, had ſcarcely taken place among the citizens of America.

II. The political events of the revolution produced different effects upon the human body, through the medium of the mind, accordingly as they acted upon the friends or enemies of the revolution.

I ſhall firſt deſcribe its effects upon the former claſs of citizens of the United States.

Many perſons of infirm and delicate habits, were reſtored to perfect health, by the change of place, or occupation, to which the war expoſed them. This was the caſe in a more eſpecial manner with hyſterical women, who were much intereſted in the ſucceſsful iſſue of the conteſt. The ſame effects of a civil war upon the hyſteria, were obſerved by Doctor Cullen in Scotland, in the years 1745 and 1746. It may perhaps help to extend our ideas of the influence of the paſſions upon diſeaſes, to add, that when either love, jealouſy, grief, or even devotion, wholly engroſs the female mind, they ſeldom fail, in like manner, to cure or to ſuſpend hyſterical complaints.

An uncommon cheerfulneſs prevailed every where, among the friends of the revolution. Defeats, and even the loſs of relations and property, were ſoon forgotten in the great objects of the war.

The population in the United States was more rapid from births during the war, than it had ever been in the ſame number of years ſince the ſettlement of the country.

I am diſpoſed to aſcribe this increaſe of births *chiefly* to the quantity and extenſive circulation of money, and to the facility of procuring the means of ſubſiſtence during the war, which favoured marriages among the labouring part of the people*. But I have ſufficient documents to prove, that marriages were more fruitful than in former years, and that a conſiderable number of unfruitful marriages became fruitful during the war. In 1783, the year of the peace, there were ſeveral children born of parents who had lived many years together without iſſue.

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* Wheat which was ſold before the war for ſeven ſhillings and ſixpence, was ſold for ſeveral years *during* the war for four, and in ſome places for two and ſixpence Pennſylvania currency per buſhel. Beggars of every deſcription diſap-

Mr. Hume informs us, in his Hiſtory of England, that ſome old people upon hearing the news of the reſtoration of Charles the IId. died ſuddenly of joy. There was a time when I doubted the truth of this aſſertion; but I am now diſpoſed to believe it, from having heard of a ſimilar effect from an agreeable political event, in the courſe of the American revolution. The door-keeper of Congreſs, an aged man, died ſuddenly, immediately after hearing of the capture of Lord Cornwallis's army. His death was univerſally aſcribed to a violent emotion of political joy. This ſpecies of joy appears to be one of the ſtrongeſt emotions that can agitate the human mind.

Perhaps the influence of that ardour in trade and ſpeculation, which ſeized many of the friends of the revolution, and which was excited by the fallacious nominal amount of the paper money,

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diſappeared in the year 1776, and were ſeldom ſeen till near the cloſe of the war.

ſhould rather be conſidered as a diſeaſe than as a paſſion. It unhinged the judgment, depoſed the moral faculty, and filled the imagination, in many people, with airy and impracticable ſchemes of wealth and grandeur. Deſultory manners, and a peculiar ſpecies of extempore conduct, were among its characteriſtic ſymptoms. It produced inſenſibility to cold, hunger, and danger. The trading towns, and in ſome inſtances the extremities of the United States, were frequently viſited in a few hours or days by perſons affected by this diſeaſe; and hence "to travel with the ſpeed of a ſpeculator," became a common ſaying in many parts of the country. This ſpecies of inſanity (if I may be allowed to call it by that name) did not require the confinement of a bedlam to cure it, like the South-Sea madneſs deſcribed by Doctor Mead. Its remedies were the depreciation of the paper money, and the events of the peace.

The political events of the revolution produced upon its enemies very different effects from thoſe which have been mentioned.

The hypochondriaſis of Doctor Cullen, occurred in many inſtances in perſons of this deſcription. In ſome of them, the terror and diſtreſs of the revolution brought on a true melancholia*. The cauſes which produced theſe diſeaſes, may be reduced to four heads. 1. The loſs of former power or influence in government. 2. The deſtruction of the hierarchy of the Engliſh church in America. 3. The change in the habits of diet, and company and manners, produced by the annihilation of juſt debts by means of depreciated paper money. And, 4. The neglect, inſults, and oppreſſion, to which the loyaliſts were expoſed, from individuals, and in ſeveral inſtances, from the laws of ſome of the ſtates.

It was obſerved in South-Carolina, that ſeveral gentlemen who had protected their eſtates by ſwearing allegiance to the Britiſh government, died ſoon after the evacuation of Charleſton by the Britiſh army. Their deaths were aſcribed to the neglect with which they were treated by their ancient friends, who had adhered to the government of the United States. The diſeaſe was called, by the common people, the *Protection fever*.

From the cauſes which produced this hypochondriaſis, I have taken the liberty of diſtinguiſhing it by the ſpecific name of *Revolutiana.*

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* Inſania partialis ſine dyſpepſia, of Doctor Cullen.

In ſome caſes, this diſeaſe was rendered fatal by exile and confinement; and, in others, by thoſe perſons who were afflicted with it, ſeeking relief from ſpirituous liquors.

The termination of the war by the peace in 1783, did not terminate the American revolution. The minds of the citizens of the United States were wholly unprepared for their new ſituation. The exceſs of the paſſion for liberty, inflamed by the ſucceſsful iſſue of the war, produced, in many people, opinions and conduct which could not be removed by reaſon nor reſtrained by government. For a while, they threatened to render abortive the goodneſs of heaven to the United States, in delivering them from the evils of ſlavery and war. The extenſive influence which theſe opinions had upon the underſtandings, paſſions and morals of many of the citizens of the United States, conſtituted a ſpecies of inſanity, which I ſhall take the liberty of diſtinguiſhing by the name of *Anarchia.*

I hope no offence will be given by the freedom of any of theſe remarks. An inquirer after philoſophical truth, ſhould conſider the paſſions of men in the ſame light that he does the laws of matter or motion. The friends and enemies of the American revolution muſt have been more or leſs than men, if they could have ſuſtained the magnitude and rapidity of the events that characteriſed it, without diſcovering ſome marks of human weakneſs, both in body and mind. Perhaps theſe weakneſſes were permitted, that human nature might receive freſh honours in America, by the contending parties (whether produced by the controverſies about independence or the national government) mutually forgiving each other, and uniting in plans of general order, and happineſs.

# AN INQUIRY INTO THE *Relation of Taſtes and Aliments* TO EACH OTHER; AND INTO THE INFLUENCE OF THIS RELATION UPON *Health and Pleaſure.*

IN entering upon this ſubject, I feel like the clown, who, after ſeveral unſucceſsful attempts to play upon a violin, threw it haſtily from him, exclaiming at the ſame time, that "there was muſic in it," but that he could not bring it out.

I ſhall endeavour, by a few brief remarks, to lay a foundation for more ſucceſsful inquiries upon this difficult ſubject.

Attraction and repulſion ſeem to be the active principles of the univerſe. They pervade not only the greateſt but the minuteſt works of nature. Salts, earths, inflammable bodies, metals, and vegetables, have all their reſpective relations to each other. The order of theſe relations is ſo uniform, that it has been aſcribed by ſome philoſophers to a latent principle of intelligence pervading each of them.

Colours, odours, and ſounds, have likewiſe their reſpective relations to each other. They become agreeable and diſagreeable, only in proportion to the natural or unnatural combination which takes place between each of their different ſpecies.

It is remarkable, that the number of original colours and notes in muſic is exactly the ſame. All the variety in both proceeds from the difference of combination. An arbitrary combination of them is by no means productive of pleaſure. The relation which every colour and ſound bear to each other, was as immutably eſtabliſhed at the creation, as the order of the heavenly bodies, or as the relation of the objects of chemiſtry to each other.

But this relation is not confined to colours and ſounds alone. It probably extends to the objects of human aliment. For example; bread and meat, meat and ſalt, the alkaleſcent meats and aceſcent vegetables, all harmonize with each other upon the tongue; while fiſh and fleſh, butter and raw onions, fiſh and milk, when combined, are all offenſive to a pure and healthy taſte.

It would be agreeable to trace the analogy of ſounds and taſtes. They have both their flats and their ſharps. They are both improved by the contraſt of diſcords. Thus pepper, and other condiments, (which are diſagreeable when taken by themſelves) enhance the reliſh of many of our aliments, and they are both delightful in proportion as they are ſimple in their compoſition. To illuſtrate this analogy by more examples from muſic, would lead us from the ſubject of the preſent inquiry.

It is obſervable that the tongue and the ſtomach, like inſtinct and reaſon, are, by nature, in uniſon with each other. One of thoſe organs muſt always be diſordered, when they diſagree in a ſingle article of aliment. When they both unite in articles of diet that were originally diſagreeable, it is owing to a perverſion in each of them, ſimilar to that which takes place in the human mind, when both the moral faculty and the conſcience loſe their natural ſenſibility to virtue and vice.

Unfortunately for this part of ſcience, the taſte and the ſtomach are ſo much perverted in infancy and childhood by heterogeneous aliment, that it is difficult to tell what kinds and mixtures of food are natural, and what are artificial. It is true, the ſyſtem poſſeſſes a power of accommodating itſelf both to artificial food, and to the moſt diſcordant mixtures of that which is natural; but may we not reaſonably ſuppoſe, that the ſyſtem would preſerve its natural ſtrength and order much longer, if no ſuch violence had been offered to it?

If the relation of aliments to each other follows the analogy of the objects of chemiſtry, then their union will be influenced by many external circumſtances, ſuch as heat and cold, dilution, concentration, reſt, motion, and the addition of ſubſtances which promote unnatural, or deſtroy natural mixtures. This idea enlarges the field of inquiry before us, and leads us ſtill further from facts and certainty upon this ſubject, but at the ſame time it does not preclude us from the hope of obtaining both; for every difficulty that ariſes out of this view of the ſubject, may be removed by obſervation and experiment.

I come now to apply theſe remarks to health and pleaſure. I ſhall ſelect only a few caſes for

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this purpoſe; for if my principles are true, my readers cannot avoid diſcovering many other illuſtrations of them.

1. When an article of diet is grateful to the taſte, and afterwards diſagrees with the ſtomach, may it not be occaſioned by ſome other kind of food, or by ſome drink being taken into the ſtomach, which refuſes to unite with the offending article of diet?

2. May not the uneaſineſs which many perſons feel after a moderate meal, ariſe from its having conſiſted of articles of aliment which were not related to each other?

3. May not the delicacy of ſtomach which ſometimes occurs after the fortieth or forty-fifth year of human life, be occaſioned by nature recovering her empire in the ſtomach, ſo as to require ſimplicity in diet, or ſuch articles only of aliment as are related? May not this be the reaſon why moſt people, who have paſſed thoſe periods of life, are unable to retain or to digeſt fiſh and fleſh at the ſame time, and why they generally dine only upon one kind of food?

4. Is not the language of nature in favour of ſimplicity in diet, diſcovered by the avidity with

which the luxurious and intemperate often ſeek relief from variety and ſatiety, by retreating to ſpring water for drink, and to bread and milk for aliment?

5. May not the reaſon why plentiful meals of fiſh, veniſon, oyſters, beef or mutton, when eaten alone, lie ſo eaſily in the ſtomach, and digeſt ſo ſpeedily, be occaſioned by no other food being taken with them? A pound, and even more, of the above articles, frequently oppreſs the ſyſtem much leſs than half the quantity of heterogeneous aliments.

6. Does not the facility with which a due mixture of vegetable and animal food digeſts in the ſtomach, indicate the certainty of their relation to each other?

7. May not the peculiar good effects of a diet wholly vegetable, or animal, be occaſioned by the more frequent and intimate relation of the articles of the ſame kingdoms to each other? And may not this be the reaſon why ſo few inconveniencies are felt from the mixture of a variety of vegetables in the ſtomach?

8. May not the numerous acute and chronic diſeaſes of the rich and luxurious, ariſe from hete-

rogeneous aliments being diſtributed in a *diffuſed*, inſtead of a *mixed* ſtate, through every part of the body?

9. May not the many cures which are aſcribed to certain articles of diet, be occaſioned more by their being taken alone, than to any medicinal quality inherent in them? a diet of oyſters in one inſtance, of ſtrawberries in another, and of ſugar of roſes in many inſtances, has cured violent and dangerous diſorders of the breaſt*. Grapes, according to Doctor Moore, when eaten in large quantities, have produced the ſame ſalutary effect. A milk diet, perſiſted in for ſeveral years, has cured the gout. I have ſeen many caſes of dyſpepſia cured by a ſimple diet of beef and mutton, and have heard of a well atteſted caſe of a diet of veal alone having removed the ſame diſorder. Squaſhes, and turnips likewiſe, when taken by themſelves, have cured that diſtreſſing complaint in the ſtomach. It has been removed even by milk, when taken by itſelf in a moderate quantity†. The farther the body, and more eſpecially the ſtomach, recede from health, the more this ſimplicity of diet becomes neceſſary. The appetite in theſe

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* Vanſweiten, 1209. 3.

† Medical Obſervations and Inquiries, Vol. VI. p. 310. 319.

caſes does not ſpeak the language of uncorrupted nature. It frequently calls for various and improper aliment; but this is the effect of intemperance having produced an early breach between the taſte and the ſtomach.

Perhaps the extraordinary cures of obſtinate diſeaſes which are ſometimes performed by perſons not regularly educated in phyſic, may be occaſioned by a long and ſteady perſeverance in the uſe of a ſingle article of the materia medica. Thoſe chemical medicines which decompoſe each other, are not the only ſubſtances which defeat, the intention of the preſcriber. Galenical medicines, by combination, I believe, frequently produce effects that are of a compound and contrary nature to their original and ſimple qualities. This remark is capable of extenſive application, but I quit it as a digreſſion from the ſubject of this inquiry.

10. I wiſh it to be obſerved, that I have condemned the mixture of different aliments in the ſtomach only in a few caſes, and under certain circumſtances. It remains yet to determine by experiments, what changes are produced upon aliments by heat, dilution, addition, concentration, motion, reſt, and the addition of uniting ſubſtances, before we can decide upon the relation of aliments

to each other, and the influence of that relation upon health. The olla podrida of Spain, is ſaid to be a pleaſant and wholeſome diſh. It is probably rendered ſo, by a previous tendency of all its ingredients to putrefaction, or by means of heat producing a new arrangement, or additional new relations of all its parts. I ſuſpect heat to be a powerful agent in diſpoſing heterogeneous aliments to unite with each other; and hence the mixture of aliments is probably leſs unhealthy in France and Spain, than in England, where ſo much leſs fire is uſed in preparing them than in the former countries.

As too great a mixture of glaring colours, which are related to each other, becomes painful to the eye, ſo too great mixture of related aliments oppreſſes the ſtomach, and debilitates the powers of the ſyſtem. The original colours of the ſky, and of the ſurface of the globe, have ever been found the moſt permanently agreeable to the eye. In like manner, I am diſpoſed to believe that there are certain ſimple aliments which correſpond, in their ſenſible qualities, with the intermediate colours of *blue* and *green*, that are moſt permanently agreeable to the tongue and ſtomach, and that every deviation from them is a departure from the ſimplicity of health and nature.

11. While nature ſeems to have limited us to ſimplicity in aliment, is not this reſtriction abundantly compenſated by the variety of taſtes which ſhe allows us to impart to it in order to diverſify and increaſe the pleaſure of eating? It is remarkable that ſalt, ſugar, muſtard, horſe-radiſh, capers, and ſpices of all kinds, according to Mr. Goſſe's experiments, related by Abbè Spallanzani*, all contribute not only to render aliments ſavory, but to promote their digeſtion.

12. When we conſider, that part of the art of cookery conſiſts in rendering the taſte of aliments agreeable, is it not probable that the pleaſure of eating might be increaſed beyond our preſent knowledge upon that ſubject, by certain new arrangements or mixtures of the ſubſtances which are uſed to impart a pleaſant taſte to our aliment?

13. Should philoſophers ever ſtoop to this ſubject, may they not diſcover and aſcertain a table of the relations of ſapid bodies to each other, with the ſame accuracy that they have aſcertained the relation of the numerous objects of chemiſtry to each other?

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* Diſſertations, Vol. I. p. 326.

14. When the tongue and ſtomach agree in the ſame kinds of aliment, may not the increaſe of the pleaſure of eating be accompanied with an increaſe of health and prolongation of life?

15. Upon the pleaſure of eating, I ſhall add the following remarks. In order to render it truly exquiſite, it is neceſſary that all the ſenſes, except that of taſte, ſhould be as *quieſcent* as poſſible. Thoſe perſons miſtake the nature of the appetite for food, who attempt to whet it by accompanying a dinner by a band of muſic, or by connecting the dining table with an extenſive and delightful proſpect. The excitement of one ſenſe, always produces collapſe in another. Even converſation ſometimes detracts from the pleaſure of eating; hence great feeders love to eat in ſilence, or alone; and hence the ſpeech of a paſſionate Frenchman, while dining in a talkative company, was not ſo improper as might be at firſt imagined. "Hold your tongues, (ſaid he) I cannot taſte my dinner." I know a phyſician, who, upon the ſame principle, always ſhuts his eyes, and requeſts ſilence in a ſick chamber, when he wiſhes to determine by the pulſe the propriety of blood-letting, in caſes where its indication is doubtful. His perceptions become more diſtinct, by confining his whole attention to the ſenſe of feeling.

It is impoſſible to mention the circumſtance of the ſenſes acting only in ſucceſſion to each other in the enjoyment of pleaſure, without being ſtruck by the impartial goodneſs of Heaven, in placing the rich and the poor ſo much upon a level in the pleaſures of the table. Could the numerous objects of pleaſure, which are addreſſed to the ears and the eyes, have been poſſeſſed at the ſame time, with the pleaſure of eating, the rich would have commanded three times as much pleaſure in that enjoyment as the poor; but this is ſo far from being the caſe, that a king has no advantage over a beggar, in eating the ſame kind of aliment.

# THE NEW METHOD OF INOCULATING FOR THE *Small Pox.*

Delivered in a Lecture in the Univerſity of Pennſylvania, on the 20th of February, 1781.

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GENTLEMEN,

IT muſt afford no ſmall pleaſure to a benevolent mind in the midſt of a war, which daily makes ſo much havoc with the human ſpecies, to reflect, that the ſmall-pox which once proved equally fatal to thouſands, has been checked in its career, and in a great degree ſubdued by the practice of INOCULATION.

It is foreign to my purpoſe to deliver to you the hiſtory of this art, and to mark the various ſteps that have attended its progreſs to its preſent

ſent ſtate of improvement. We have yet to lament the want of uniformity and of equal ſucceſs in the practice of it among phyſicians. A great number of pamphlets have been written upon the ſubject without exhauſting it. There is ſtill ample room left for the man of genius to exerciſe his talents for obſervation and reaſoning upon it. The facts I mean to lay before you are ſo inconſiderable, compared with what ſtill remain to be known upon this ſubject, that I have to requeſt, when your knowledge in it is completed, that you would bury my name in ſilence; and forget that ever I ventured to lay a ſingle ſtone in this part of the fabric of ſcience.

In treating upon this ſubject, I ſhall

I. Conſider the proper ſubjects and ſeaſons for inoculation.

II. I ſhall deſcribe the method of communicating the diſorder.

III. I ſhall conſider the method of preparing the body for the ſmall-pox.

IV. I ſhall mention the treatment proper during the eruptive fever; and,

V. Point out a few cautions that are neceſſary after the diſeaſe is over.

I. Formerly there were great difficulties in the choice of the ſubjects for *Inoculation.* But experience teaches us that it may be practiſed in every ſtage of life, and in almoſt every condition of the human body. In infancy the periods before and after dentition are to be preferred. But we ſeldom ſee any great inconveniences from ſubmittting to the general neceſſity of inoculating children between the ages of three months and two years. Indeed we often ſee children cut three or four teeth during the preparation and eruptive fever, without the leaſt addition being made to any of the troubleſome ſymptoms which accompany the ſmall-pox. There is one inconvenience attending the choice of the firſt months of infancy for inoculating, and that is, the matter often fails of producing the diſorder in ſuch young ſubjects. I have frequently failed in two or three attempts to communicate the diſorder to children under four months old with the ſame matter that has ſucceeded in a dozen other patients inoculated at the ſame time. When the inoculation ſucceeds in ſuch tender ſubjects, they generally have leſs fever, and fewer puſtules, than are common in any future period of life.

Although a phyſician would prefer a patient in good health to any other as a ſubject for inoculation, yet caſes often occur in which it is neceſſary to communicate the ſmall-pox while the body is affected with ſome other diſorder. I can with pleaſure inform you, that the ſmall-pox is rendered ſo perfectly ſafe by inoculation, that there are few chronic diſeaſes which ſhould be conſidered as obſtacles in the way of it. I have inoculated patients labouring under a tertian fever, obſtructed viſcera, the hooping cough, the hypochondriaſis, the aſthma, the itch, and other cutaneous diſorders, and even pregnant women, with the ſame, and in ſome inſtances, with greater ſucceſs than perſons in perfect health. Doctor Cullen informs us that he has ſeen inoculation ſucceed in ſcrophulous patients. A phyſician in Jamaica informed me that he had inoculated Negroes with ſucceſs in the worſt ſtage of the yaws. To theſe facts I muſt add one more extraordinary than any that has been yet mentioned: Doctor Brown, my late colleague in the care of the military hoſpitals, informed me, that he had ſeen inocula tion ſucceedn patients who were ſeized, after the infection was communicated, with the hoſpital fever. The preparation of the body ſhould be accommodated to the diſeaſe which affects it. Some phyſicians have thought the ſmall-pox, received in this way, was a remedy for other diſeaſes, but my experience has not confirmed this opinion. On the contrary, I am diſpoſed to think that no other change is produced by inoculation, than by the regimen and medicines that are uſed to prepare the body for the ſmall-pox. Nor does the ſmall-pox, during its continuance, afford any ſecurity againſt the attacks of other diſeaſes. I have ſeen the moſt alarming complication of the ſmall-pox and meaſles in the ſame perſon.

The ſeaſons commonly preferred for inoculation in this country are, the ſpring and fall. It may be practiſed with equal ſafety in the winter, a due regard being had to the temperature of the air in the preparation of the body.

The principal objection to inoculating in the ſummer months in this climate, ariſes from the frequency of bilious diſorders at that ſeaſon, to which the preparation neceſſary for the ſmall-pox probably diſpoſes the body. This caution applies more directly to children who at a certain age are more ſubject than grown people to a diſorder in their bowels in warm weather.

II. The methods of communicating the ſmall-pox by inoculation, have been different in different countries, and in the different æras of its progreſs towards its preſent ſtage of improvement. The ſcab, doſſel of lint, and the thread impregnated with variolous matter and bound up in a gaſh in the arm, have been laid aſide.

We are indebted to Mr. Sutton for the mode of communicating it by a ſlight puncture with the point of a lancet, or needle, dipt in freſh matter. As it is difficult ſometimes to procure matter in a freſh ſtate, I have been led to uſe it with equal ſucceſs by preſerving it on lint in a box, and moiſtening it with cold water juſt before I uſed it. Matter may be kept in this way for a month without loſing its infectious quality, provided it be not expoſed to heat or moiſture. The former deſtroys its power of infecting as certainly as the ſalt of tartar deſtroys the acidity of vinegar. Moiſture, by remaining long upon the matter, probably deſtroys its virulence by ſubjecting it to fermentation. The longer matter has been kept in a general way, the longer the diſtance will be between the time of communicating the diſorder and the eruptive fever. It will be proper always to yield to the prejudices of our patients in favour of matter taken from perſons who have but few puſtules. But I am perſuaded from repeated obſervations, that the diſeaſe is no ways influenced by this circumſtance.

cumſtance. I am ſatisfied likewiſe that there is no difference between the effects of the matter, whether it be taken in its watery and purulent ſtate. The puncture ſhould not be larger than is ſufficient to draw one drop of blood, but it ſhould always be made by a *ſharp* lancet, for the ſudden inflammation and ſuppuration, excited by a dull lancet, ſometimes throw off the matter ſo as to prevent its infecting the body [*]. No plaſter or bandage ſhould be applied over the puncture. It ſhould be made in the left arm of all ſubjects. The objections to inoculating in the leg are too obvious to be mentioned. I have heard of the diſeaſe being communicated by rubbing the dry ſkin with the matter. My own obſervations upon this ſubject give me reaſon to ſuſpect the facts that are contained in books relative to this mode of infecting the body. I have bound large pieces of lint dipt in freſh matter for twenty-four hours upon the arm, without producing the diſorder. A practitioner of phyſic in *New-Jer-*

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[*] I am diſpoſed to believe that the external aplications which are uſed by the Indians for the cure of the bite of poiſonous ſnakes, act only by exciting inflammation and ſuppuration, which diſcharge the poiſon from the wound before it is abſorbed. All their external remedies are of a *ſtimulating* nature.

*ſey* informed me that he once gave a conſiderable quantity of freſh variolous matter in a doſe of phyſic without infecting his patient. I ſuſpect the matter that produces the diſeaſe is of the ſame nature with certain poiſons, which require to be brought in contact with a wound or ſore in the body before they produce their effects. I deliver this opinion with diffidence. The ſubject ſtands in need of more experiments and inveſtigation

III. I come now to conſider the beſt method of preparing the body for the ſmall-pox. This muſt be done, 1ſt by DIET, and 2dly by MEDICINE. The DIET ſhould conſiſt chiefly of vegetables. I have never ſeen any inconvenience from the free uſe of milk as a part of the preparative diet. In ſome habits, where a morbid acid prevails in the ſtomach, we may indulge our patients in a little weak fleſh broth two or three times a week with ſafety. Tea, coffee, and even weak chocolate, with biſcuit or dry toaſt, may be uſed as uſual, by perſons accuſtomed to that kind of aliment. Wine and ſpirits of all kinds ſhould be with-held from our patients during the preparation. The more aſceſcent their drinks are, the better. It is unneceſſary that this change in the diet ſhould take place till a day or two before the time of communicating the diſorder. The ſyſtem accommodates to a vegetable and low diet in the courſe of three weeks or a month, ſo as to defeat in ſome meaſure the advantages we expected from it. The good effects of it appear to depend in a great degree upon the *ſuddenneſs* with which we oblige our patients to conform to it. For this reaſon, when we are called upon to inoculate perſons who have lived more than three or four weeks upon a low diet, we ſhould always direct them to live a few days upon animal food before we communicate the diſorder to them. By theſe means we may produce all the good effects of the *ſudden* change in the diet I have already mentioned. 2. The MEDICINES moſt commonly uſed to prepare the body for the ſmall-pox are antimony and mercury. The latter has had the preference, and has been given in large quantities under a notion of its being a ſpecific antidote to the variolous matter. Many objections might be made to this opinion; I ſhall mention only three.

1. We often ſee the diſorder in a high degree after the ſyſtem is fully impregnated with mercury.

2. We often ſee the ſame ſalutary effects of mercury when given before the diſorder is communicated to the body, that we perceive when it is given after inoculation; in which caſe we are ſure

the mercury cannot enter into the mixture with the variolous matter ſo as to deſtroy it.

3. If mercury acted ſpecifically in deſtroying the variolous matter, it would render every other part of the preparation unneceſſary, but this we know is not the caſe, for the neglect or improper uſe of the vegetable diet or cool regimen is often attended with an extraordinary number, or virulence of the ſmall-pox, even in thoſe caſes where mercury is given in the largeſt quantity.

The way in which mercury prepares the body for the ſmall-pox, ſeems to be by promoting the ſeveral excretions, particularly that by perſpiration, which, by diminiſhing the quantity of the fluids and weakening the tone of the ſolids, renders the ſyſtem leſs liable to a plentiful eruption of the ſmall-pox. But I object to the uſe of this medicine for the following reaſons:

1. It effectually deprives us of all the benefits of the cool regimen; for mercury we know, always *diſpoſes* the ſyſtem to take cold.

2. All the good effects of mercury may be produced by PURGES, which do not ſubject the body to the above-mentioned inconvenience.

The PURGES may be ſuited to the conſtitutions, and in ſome caſes, even to the inclinations of our patients. I have ſeen jalap, rhubarb, ſenna, manna, aloes, ſoluble tartar, glauber and Epſom ſalts, and the butternut pill, all given with equal ſucceſs. The quantity ſhould be ſufficient to procure three or four ſtools every day. A little magneſia ſhould always be mixed with rhubarb and jalap in preparing children. It will be ſufficient for the mothers and nurſes of infants to conform ſtrictly to the vegetable diet. I have never ſeen any advantages from giving them even a ſingle doſe of phyſic.

It is hardly neceſſary to obſerve, that the quality, doſe, and number of purges are to be determined by the age, ſex, and habits of our patients. A conſtitution enfeebled with a previous diſeaſe forbids the uſe of purges, and requires medicines of a reſtorative kind. Patients afflicted with cutaneous diſorders bear larger and more frequent doſes of phyſic than are indicated in more healthy ſubjects.

In adult ſubjects of a plethoric habit, bloodletting is very uſeful on the third or fourth day after inoculation. We are not to ſuppoſe, that every fat perſon labours under a plethora. A moderate degree of fat is ſo far from rendering the diſeaſe more violent, eſpecially in children, that I think I have generally found ſuch ſubjects have the ſmall-pox more favourably than others.

Moderate exerciſe in the open air ſhould be uſed during the preparation. But hard labour, and every thing that promotes ſweat or fatigue, as alſo the extremes of heat and cold, ſhould be avoided.

IV. We come now to conſider the treatment of the body during the eruptive fever. On the eighth day after inoculation our patients are *generally* ſeized with the common ſymptoms of fever. Sometimes this fever appears on the ſixth and ſeventh day after inoculation. But when it is irregular, it is often delayed till the ninth and tenth days. I have ſeen many inſtances of it on the fourteenth, a few on the fifteenth and ſixteenth, and *one* caſe in which it did not come on till the eighteenth day after the infection was communicated to the body*. The place where the puncture was made with the lancet, or needle, generally ſerves as an harbinger of the approaching fever. A ſlight inflammation appears about it and a pock riſes up in the centre. But this remark is liable to ſome objections. I have ſeen *four* inſtances in which the fever came on at the expected time, and the diſorder went through all its ſtages with the greateſt regularity, and yet there was no ſign of an inflammation or pock near the ſpot where the puncture was made: even the puncture itſelf became inviſible. On the other hand, we ſometimes ſee an inflammation and pock on the arm appear on the eighth and ninth days without any fever accompanying them. Some phyſicians pretend that this inflammation and ſolitary pock are ſufficient to conſtitute the diſeaſe; but repeated experience has taught me to be very cautious in relying upon theſe equivocal marks. It is true, I have ſometimes ſeen patients ſecured againſt the ſmall-pox both in the natural way and by inoculation where theſe marks have appeared; but I have as often ſeen ſuch patients ſeized afterwards with the ſmall-pox in the natural way, to the great diſtreſs of families and mortification of phyſicians.

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* Since the publication of the firſt edition of this lecture, I have heard of two caſes, in one of which the fever did not come on till the twentieth, and in the other till the twenty-firſt day after the infection was communicated to the body. In ſome of theſe tedious caſes, I have ſeen an inflam-

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inflammation and ſuppuration on the punctured part of the arm on the eighth day without any fever. Perhaps in theſe caſes the inflammation and ſuppuration are only cuticular, and that the ſmall-pox is taken from the matter which is formed by them.

ſicians. Upon this account I make it a conſtant practice to adviſe a ſecond or third inoculation where a fever and eruption have been wanting. As the abſence of theſe ſymptoms is probably occaſioned by the weakneſs or age of the variolous matter, or the too high ſtate of preparation of the body, we ſhould always guard againſt both, by making the puncture the ſecond time with *freſh* matter, by ſubjecting our patients to a *leſs* abſtemious diet, and by giving fewer doſes of phyſic. I have heard it remarked, that if a ſlight redneſs and a ſmall pimple appeared on the arm on the third day after inoculation, it was a ſign the matter had infected the whole conſtitution. I acknowledge I have often ſeen a greater degree of redneſs on the third than on the ſecond day after inoculation, but I have not been able to eſtabliſh a diagnoſtic mark from it; for I have ſeen the diſeaſe produced on the uſual days where the redneſs has appeared on the ſecond day, and in ſome caſes where it has not appeared until the eruptive fever.

I am led here unwillingly to diſcuſs the old queſtion, Is it poſſible to have the ſmall-pox in the natural way after inoculation?—In many of the caſes ſuppoſed to be the ſmall-pox from inoculation, it is probable the matter has been taken from the chicken-pox, which reſembles the ſmall-pox in many of its peculiarities, but in none more than that of leaving pits or marks on the ſkin. But there are certainly caſes where there are the moſt irrefragable proofs of the infection implanted by inoculation being of a variolous nature, where the diſorder has been afterwards taken in the natural way. In theſe caſes I would ſuppoſe the variolous matter produced only a topical or cuticular diſorder. We ſee ſomething analogous to this in nurſes who attend patients in the ſmall-pox. But further, this topical or cuticular infection may be produced by art in perſons who have had the ſmall-pox in the natural way. Some years ago I made a puncture on my left hand with a lancet moiſtened with variolous matter. On the eighth day an inflammation appeared on the place, accompanied by an efflореſcence in the neighbourhood of it, which extended about two inches in every direction from the ſpot where the puncture was made. On the eleventh day I was ſurpriſed to find two pocks (if I may venture to call them ſuch) the one on the outſide of the fourth finger of my left hand, and the other on my forehead. They remained there for ſeveral days, but without filling with matter, and then dropped off rather in the form of a ſoft wart, than of acommon ſcab. Doctor Way, of Wilmington, repeated the ſame experiment upon himſelf, but with an iſſue to his curioſity more extraordinary than that I have juſt now related. On the eighth day after he had made a puncture on his hand, a pock appeared on the ſpot, which in the uſual time filled with matter, from which he inoculated ſeveral children, who ſickened at the uſual time, and went through all the common ſtages and ſymptoms of the ſmall-pox. It would ſeem from theſe facts, that it is neceſſary the ſmall-pox ſhould produce ſome impreſſion upon the *whole* ſyſtem, in order to render it ever afterwards incapable of receiving an impreſſion of a ſimilar nature. A fever and an eruption therefore ſeem neceſſary for this purpoſe. As the inflammation of the arm on the eighth day is a ſign of the *topical* and cuticular infection, ſo an eruption (though ever ſo ſmall) ſeems to be the only certain ſign of the infection of the *whole* ſyſtem. The eruption is the more deciſive in its report in proportion as it comes out and goes off in the uſual manner of the ſmall-pox in the natural way. In thoſe caſes where patients have been ſecured againſt a ſecond attack of the diſorder, when there have been no *obvious* fever or *viſible* eruption, I think I have obſerved an unuſual inflammation, and a copious and long continued diſcharge of matter from the arm. Perhaps this may ſerve as an outlet of the matter, which in other caſes produces the fever and eruption. I am the more diſpoſed to embrace this opinion from the teſtimony which ſeveral authors have left us of the effects of ulcers in ſecuring the body from the infection of the plague. The effects of iſſues are ſtill more to our purpoſe. We obſerve a plentiful diſcharge of matter from them every time the body is expoſed to cold, and the febrile effects of it upon the ſyſtem are thereby frequently obviated. How far a ratio exiſts between the degrees of inflammation and the diſcharge of matter from the arm, and the degrees of fever and eruption, muſt be determined by future and very accurate obſervations. If it ſhould appear, that there are the leaſt inflammation and ſmalleſt diſcharge, where there have been the higheſt fever and moſt copious eruption; and on the contrary, if it ſhould appear, that there are the greateſt inflammation and diſcharge where there have been the leaſt fever and ſmalleſt eruption, I muſt beg leave to add, without attempting in this place to explain the reaſons of it, that the remark, if generally true, is liable to ſome exceptions. But the ſubject is involved in darkneſs; I ſhall be ſatisfied if I have brought you within ſight of the promiſed land. Your own ingenuity, like another Jewiſh leader, muſt conduct you thither.

The indications in the treatment of the body during the eruptive fever are, 1ſt. To regulate the degree of fever.

2d. To mitigate troubleſome and alarming ſymptoms.

The fever which produces the eruption is generally of the inflammatory kind. It ſometimes therefore comes on with the ſymptoms of great heat, preceded with chillineſs, and determination to the head and breaſt, and a full hard pulſe. The remedies proper in this caſe are,

A. Blood-letting. The quantity to be drawn muſt be regulated by the violence of the ſymptoms, the conſtitution, habits, and even country of the patient, and by the ſeaſon of the year. I have never found more than one bleeding, to the quantity of twelve or fourteen ounces, neceſſary in any ſtage or degree of the eruptive fever of the ſmall-pox by inoculation.

B. Cool air is of the utmoſt conſequence in the eruptive fever. The uſe of this remedy in fevers marks an æra, not only in the management of the ſmall-pox, but in medicine. The degrees of cold ſhould always be increaſed in proportion to the violence of the fever. Stove-rooms, ſo common in this country, ſhould be carefully avoided.

The more we oblige our patients to ſit up and walk in the open air, the better. Even in thoſe caſes where they languiſh moſt for the bed, they ſhould be encouraged rather to lie upon, than *under* the bed-clothes. Children ſhould be ſtript of flannel petticoats that come in contact with their ſkins; and even clouts ſhould be laid aſide if poſſible, without great inconvenience, and at any rate they ſhould be often removed. Great and obvious as the advantages of cold air appear to be in the eruptive fever, it has ſometimes been uſed to an exceſs that has done miſchief. There are few caſes where a degree of cold below forty of *Fahrenheit's* thermometer is neceſſary in this ſtage of the ſmall-pox. When it has been uſed below this, or where patients have been expoſed to a damp atmoſphere ſome degrees above it, I have heard of inflammations of an alarming nature being produced in the throat and breaſt.

C. The bowels, more eſpecially of children, ſhould be kept open with gentle laxatives. And,

D. Cool ſubacid drinks ſhould be plentifully uſed until the eruption be completed.

Sometimes the ſmall-pox comes on with a fever the reverſe of that which we have deſcribed. The heat is inconſiderable, the pulſe is weak, and ſcarcely quicker than ordinary, and the patient complains of but ſlight pains in the back and head. Here the treatment ſhould be widely different from that which has been mentioned when the fever is of the inflammatory kind. Bleeding in this caſe is hurtful, and even cool air muſt be admitted with caution. The buſineſs of the phyſician in this caſe is to excite a gentle action in the ſanguiferous ſyſtem, in order to produce the degree of fever which is neceſſary to the eruption of the pock. For this purpoſe he may recommend the uſe of warm drinks, and even of a warm bed with advantage. If the eruption delays beyond the third day, with all the circumſtances of debility that have been mentioned, I have frequently ordered my patients to eat a few ounces of animal food, and to drink a glaſs or two of wine, with the moſt deſirable ſucceſs. The effects of this indulgence are moſt obvious where the weakneſs of the fever and the delay of the eruption in children, have made it neceſſary to allow it to mothers and nurſes.

The ſmall-pox by inoculation ſo ſeldom comes on with the ſymptoms of what is called a putrid fever, that little need be ſaid of the treatment proper in ſuch caſes. I ſhall only obſerve, that the cold regimen in the higheſt degree, promiſes more ſucceſs in theſe caſes than in any others. I have repeatedly been told, that when the ſmall-pox appears confluent among the Africans, it is a common practice for mothers to rub their children all over with pepper, and plunge them immediately afterwards into a ſpring of cold water. This, they ſay, deſtroys a great part of the pock, and diſpoſes the remainder to a kindly ſuppuration. From the ſucceſs that has attended the uſe of the cold bath in putrid fevers in ſome parts* of Europe, mentioned in a former lecture, I am diſpoſed to believe in the efficacy of the African remedy.

The fever generally laſts three days, and the eruption continues for a ſimilar length of time, counting the laſt day of the fever as the firſt day of the eruption. But this remark is liable to many exceptions. We ſometimes obſerve the eruption to begin on the firſt, and often on the ſecond day of the fever; and we ſometimes meet with caſes in which a ſecond eruption comes on after the fever has abated for ſeveral days, and the firſt eruption conſiderably advanced in its progreſs towards a complete ſuppuration. This is often occaſioned by the application of exceſſive cold or heat to the body, or by a ſudden and premature uſe of ſtimulating drinks or animal food.

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* In a diſſertation entitled "*Epidemia verna quæ Wratiſlaviam, Anno.* 1737 *afflixit*," publiſhed in the appendix to the Acta Nat. Curios, Vol. X. it appears, that waſhing the body all over with cold water in putrid fevers, attended with great debility, was attended with ſucceſs at *Breſlaw* in *Sileſia*. The practice has ſince been adopted, we are told, by ſeveral of the neighbouring countries. CULLEN'S FIRST LINES OF THE PRACTICE OF PHYSIC.

I come now to treat of the beſt method of mitigating troubleſome and alarming ſymptoms.

The only *alarming* ſymptom is convulſions, to which children are ſubject during the time of dentition. Theſe have been leſs frequent, ſince the liberal and judicious uſe of cool air in the eruptive fever than formerly. They are often relieved by putting the feet in warm water. But a more effectual and ſpeedy method of curing them, is to expoſe our patients ſuddenly to the open air. The colder the air the quicker relief it affords in theſe caſes. To prevent the return of the fits, as well as to allay any diſagreeable and troubleſome ſtartings, a few drops of laudanum ſhould be given. They generally yield in a little while to this excellent remedy.

The next ſymptom which demands the aid of our art, is the inflammation and ſore on the arm.

Poultices of all kinds ſhould be laid aſide, as tending to increaſe the inflammation and ſore. Inſtead of theſe, the part affected ſhould be waſhed three or four times a day with cold water*. This application is not only agreeable to our patients, but ſoon checks the progreſs of the inflammation, and diſpoſes the ſore to heal about the time the eruption is compleated. The eyes ſhould likewiſe be waſhed frequently with cold water, to ſecure them from puſtules and inflammation. With reſpect to thoſe alarming or troubleſome ſymptoms which occur in thoſe caſes where the pocks are numerous, or confluent, they happen ſo ſeldom in inoculation, that they do not come properly under our notice in this place. They are moreover fully diſcuſſed by Doctors Boerhaave, Huxham, Hillary, and other practical writers.

V. I come now, in the laſt place, to deliver a few directions that are neceſſary after the eruption and ſuppuration are over.

It is well known that eruptions of an obſtinate nature ſometimes follow the ſmall-pox. Theſe I believe are often occaſioned by a too *ſudden* and ſpeedy uſe of animal food. To guard againſt theſe diſagreeable conſequences of inoculation, it is of the utmoſt importance to enjoin a cautious and *gradual* return to the free uſe of an animal diet; and at the ſame time it will be neceſſary to give our patients a doſe or two of purging phyſic.

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* Where the inflammation on the arm has been ſo conſiderable as not to yield immediately to the application of cold water, I have uſed the vegeto-mineral water with advantage.

Thus, gentlemen, have I delivered to you a ſhort hiſtory of the new method of inoculating for the ſmall-pox. I am aware that prejudices are entertained againſt ſome parts of it by phyſicians of the moſt ancient name and character among us. I have witneſſed the effects of the old and new methods of preparing the body upon many thouſand patients, and I am ſatisfied not only from my own obſervations, but from the experience of gentlemen upon whoſe judgments I rely more than upon my own, that the new method is by far the ſafeſt and moſt ſucceſsful. Added to this, I can aſſure my pupils, that I have never known a ſingle inſtance of a patient, prepared and treated in the manner I have deſcribed, that ever had an abſceſs after the ſmall-pox, or even ſuch an inflammation or ſore upon the arm as required the application of a poultice.

# APPENDIX,

CONTAINING

# OBSERVATIONS

ON THE

# *Duties of a Phyſician,*

AND THE

METHODS OF IMPROVING

# MEDICINE.

ACCOMMODATED TO THE PRESENT STATE OF SOCIETY
AND MANNERS IN THE UNITED STATES.

DELIVERED IN THE UNIVERSITY OF PENNSYLVANIA,
FEBRUARY 7, 1789, AT THE CONCLUSION OF A COURSE OF
LECTURES UPON CHEMISTRY AND THE
PRACTICE OF PHYSIC.

*PUBLISHED AT THE REQUEST OF THE CLASS.*

# APPENDIX.

GENTLEMEN,

I SHALL conclude our courſe of lectures, by delivering to you a few directions for the regulation of your future conduct and ſtudies, in the line of your profeſſion.

I ſhall, *firſt*, ſuggeſt the moſt probable means of eſtabliſhing yourſelves in buſineſs, and of becoming acceptable to your patients, and reſpectable in life.

*Secondly.* I ſhall mention a few thoughts which have occurred to me on the mode to be purſued, in the further proſecution of your ſtudies, and for the improvement of medicine.

I. Permit me, in the firſt place, to recommend to ſuch of you as intend to ſettle in the country, to eſtabliſh yourſelves as early as poſſible upon *farms*. My reaſons for this advice are as follow:

1. It will reconcile the country people to the liberality and dignity of your profeſſion, by ſhewing them that you aſſume no ſuperiority over them from your education, and that you intend to ſhare with them in thoſe toils, which were impoſed upon man in conſequence of the loſs of his innocence. This will prevent envy, and render you acceptable to your patients as men, as well as phyſicians.

2. By living on a farm you may ſerve your country by promoting improvements in agriculture. Chemiſtry (which is now an important branch of a medical education) and agriculture are cloſely allied to each other. Hence ſome of the moſt uſeful books upon agriculture have been written by phyſicians. Witneſs the eſſays of Dr. Home of Edinburgh, and of Dr. Hunter of Yorkſhire in England.

3. The buſineſs of a farm will furniſh you with employment in the healthy ſeaſons of the year, and thereby deliver you from the tædium vitæ, or what is worſe, from retreating to low or improper company. Perhaps one cauſe of the prevalence of dram or grog drinking, with which country practitioners are ſometimes charged, is owing to their having no regular or profitable buſineſs to employ them in the intervals of their attendance upon their patients.

4. The reſources of a farm will create ſuch an independence as will enable you to practice with more dignity, and at the ſame time ſcreen you from the trouble of performing unneceſſary ſervices to your patients. It will change the nature of the obligation between you and them. While *money* is the only means of your ſubſiſtence, your patients will feel that they are the channels of your daily bread; but while your farm furniſhes you with the neceſſaries of life, your patients will feel more ſenſibly, that the obligation is on their ſide, for health and life.

5. The exigencies and wants of a farm in *ſtock* and *labour* of all kinds, will enable you to obtain from your patients a compenſation for your ſervices in thoſe articles. They all poſſeſs them, and men part with that of which money is only the ſign, much more readily than they do with money itſelf.

6. The reſources of a farm will prevent your cheriſhing, for a moment, an impious wiſh for the prevalence of ſickneſs in your neighbourhood. A healthy ſeaſon will enable you to add to the produce of your farm, while the rewards of an unhealthy ſeaſon will enable you to repair the inconvenience of your neceſſary abſence from it. By

theſe means your purſuits will be marked by that *variety* and *integrity*, in which true happineſs is ſaid to conſiſt.

7. Let your farms be ſmall, and let your *principal* attention be directed to graſs and horticulture. Theſe afford moſt amuſement, require only moderate labour, and will interfere leaſt with your duties to your profeſſion.

II. Avoid ſingularities of every kind in your manners, dreſs, and general conduct. Sir Iſaac Newton, it is ſaid, could not be diſtinguiſhed in company, by any peculiarity, from a common well-bred gentleman. Singularity in any thing, is a ſubſtitute for ſuch great or uſeful qualities as command reſpect; and hence we find it chiefly in little minds. The profane and indelicate combination of extravagant ideas, improperly called wit, and the formal and pompous manner, whether accompanied by a wig, a cane, or a ring, ſhould be all avoided, as incompatible with the ſimplicity of ſcience and the real dignity of phyſic. There is more than one way of playing the quack. It is not neceſſary, for this purpoſe, that a man ſhould advertiſe his ſkill, or his cures, or that he ſhould mount a phaeton and diſplay his dexterity in operating, to an ignorant and gaping multitude. A phyſician acts the ſame part in a different way, who aſſumes the character of a madman or a brute in his manners, or who conceals his fallibility by an affected gravity and taciturnity in his intercourſe with his patients. Both characters, like the quack, impoſe upon the public. It is true, they deceive different ranks of people; but, we muſt remember that there are two kinds of vulgar, viz. the rich and the poor; and that the rich vulgar are often below the poor, in ignorance and credulity.

III. It has been objected to our profeſſion, that many eminent phyſicians have been unfriendly to chriſtianity. If this be true, I cannot help aſcribing it in part to that neglect of public worſhip with which the duties of our profeſſion are often incompatible; for it has been juſtly obſerved, that the neglect of this religious and ſocial duty, generally produces a relaxation, either in principles or morals. Let this fact lead you, in ſetting out in buſineſs, to acquire ſuch habits of punctuality in viſiting your patients, as ſhall not interfere with acts of public homage to the Supreme Being. Dr. Gregory has obſerved, that a cold heart is the moſt frequent cauſe of deiſm. Where this occurs in a phyſician, it affords a preſumption that he is deficient in humanity. But I cannot admit that infidelity is peculiar to our profeſſion. On the contrary, I believe chriſtianity places among its friends more men of extenſive abilities and learning in medicine, than in any other ſecular employment. Stahl, Hoffman, Boerhaave, Sydenham, Haller and Fothergill were all chriſtians. Theſe enlightened phyſicians were conſidered as the ornaments of the ages in which they lived, and poſterity has juſtly ranked them among the greateſt benefactors of mankind.

IV. Permit me to recommend to you a regard to all the intereſts of your country. The education of a phyſician gives him a peculiar inſight in the principles of many uſeful arts, and the practice of phyſic favours his opportunities of doing good, by diffuſing knowledge of all kinds. It was in Rome, when medicine was practiſed only by ſlaves, that phyſicians were condemned by their profeſſion "mutam exercere artem." But in modern times, and in free governments, they ſhould diſdain an ignoble ſilence upon public ſubjects. The American revolution has reſcued phyſic from its former ſlaviſh rank in ſociety. For the honour of our profeſſion it ſhould be recorded, that ſome of the moſt intelligent and uſeful characters, both in the cabinet and the field during the late war, have been phyſicians. The illuſtrious Dr. Fothergill oppoſed faction and tyranny, and took the lead in all public improvements in his native country, without ſuffering thereby the leaſt diminution of that reputation, or buſineſs, in which, for forty years, he flouriſhed almoſt without a rival in the city of London.

V. Let me adviſe you, in your viſits to the ſick, *never* to appear in a hurry, nor to talk of indifferent matters before you have made the neceſſary inquiries into the ſymptoms of your patient's diſeaſe.

VI. Avoid making light of any caſe. "Reſpice finem" ſhould be the motto of every indiſpoſition. There is ſcarcely a diſorder ſo trifling, that has not directly, or indirectly, proved an outlet to human life. This conſideration ſhould make you anxious and punctual in your attendance upon every acute diſeaſe, and keep you from riſking your reputation by an improper or haſty prognoſis.

VII. Do not condemn, or oppoſe, unneceſſarily, the ſimple preſcriptions of your patients. Yield to them in matters of little conſequence, but maintain an inflexible authority over them in matters that are eſſential to life.

VIII. Preſerve, upon all occaſions, a compoſed or cheerful countenance in the room of your patients, and inſpire as much hope of a recovery as you can, conſiſtent with truth, eſpecially in acute diſeaſes. The extent of the influence of the will over the human body, has not yet been fully aſcertained. I reject the futile pretenſions of Mr. Meſmer to the cure of diſeaſes, by what he has abſurdly called animal magnetiſm. But I am willing to derive the ſame advantages from his deceptions, which the chemiſts have derived from the deluſions of the alchemiſts. The facts which he has eſtabliſhed, clearly prove the influence of the imagination, and will, upon diſeaſes. Let us avail ourſelves of the handle which thoſe powers of the mind preſent to us, in the ſtrife between life and death. I have frequently preſcribed remedies of doubtful efficacy in the critical ſtage of acute diſeaſes, but never till I had worked up my patients into a confidence, bordering upon certainty, of their probable good effects. The ſucceſs of this meaſure has much oftener anſwered, than diſappointed my expectations; and while my patients have commended the vomit, the purge or the bliſter which was preſcribed, I have been diſpoſed to attribute their recovery to the vigorous concurrence of the *will* in the action of the medicine. Does the will beget inſenſibility to cold, heat, hunger,

ger, and danger? Does it ſuſpend pain, and raiſe the body above feeling the pangs of Indian tortures? Let us not then be ſurpriſed that it ſhould enable the ſyſtem to reſolve a ſpaſm, to open an obſtruction, or to diſcharge an offending humour. I have only time to hint at this ſubject. Perhaps it would lead us, if we could trace it fully, to ſome very important diſcoveries in the cure of diſeaſes.

IX. Permit me to adviſe you in your intercourſe with your patients, to attend to that principle in the human mind, which conſtitutes the aſſociation of ideas. A chamber, a chair, a curtain, or even a cup, all belong to the means of life or death, accordingly as they are aſſociated with cheerful or diſtreſſing ideas, in the mind of a patient. But this principle is of more immediate application in thoſe chronic diſeaſes which affect the mind. Nothing can be accompliſhed here, till we produce a new aſſociation of ideas. For this purpoſe a change of place and company are abſolutely neceſſary. But we muſt ſometimes proceed much further. I have heard of a gentleman in South-Carolina who cured his fits of low ſpirits by changing his clothes. The remedy was a rational one. It produced at once a new train of ideas, and thus removed the paroxyſm of his diſeaſe.

X. Make it a rule never to be angry at any thing a ſick man ſays or does to you. Sickneſs often adds to the natural irritability of the temper. We are, therefore, to bear the reproaches of our patients with meekneſs and ſilence. It is folly to reſent injuries at any time, but it is cowardice to reſent an injury from a ſick man; ſince, from his weakneſs and dependence upon us, he is unable to contend with us upon equal terms. You will find it difficult to attach your patients to you by the obligations of friendſhip or gratitude. You will ſometimes have the mortification of being deſerted by thoſe patients who owe moſt to your ſkill and humanity. This led Dr. Turner to adviſe phyſicians never to chuſe their friends from among their patients. But this advice can never be followed by a heart that has been taught to love true excellency, whereever it finds it. I would rather adviſe you to give the benevolent feelings of your hearts full ſcope, and to forget the unkind returns they will often meet with, by giving to human nature—— a tear.——

XI. Avoid giving a patient over in an acute diſeaſe. It is impoſſible to tell in ſuch caſes where life ends, and where death begins. Hundreds of patients have recovered, who have been pronounced incurable, to the great diſgrace of our profeſſion. I know that the practice of predicting danger and death upon every occaſion, is ſometimes made uſe of by phyſicians, in order to enhance the credit of their preſcriptions if their patients recover, and to ſecure a retreat from blame, if they ſhould die. But this mode of acting is mean and illiberal. It is not neceſſary that we ſhould decide with confidence at any time, upon the iſſue of a diſeaſe.

XII. A phyſician in ſickneſs is always a welcome viſitor in a family; hence he is often ſolicited to partake of the uſual ſign of hoſpitality in this country, by taking a draught of ſome ſtrong liquor, every time he enters into the houſe of a patient. Let me charge you to lay an early reſtraint upon yourſelves, by refuſing to yield to this practice, eſpecially in the *forenoon.* Many phyſicians have been innocently led by it into habits of drunkenneſs. You will be in the more danger of falling into this vice, from the great fatigue and inclemency of the weather to which you will be expoſed in country practice. But you have been taught that ſtrong drink affords only a temporary relief from thoſe evils, and that it afterwards renders the body more ſenſible of them.

XIII. I ſhall now give ſome directions with reſpect to the method of charging for your ſervices to your patients.

When we conſider the expence of a medical education, and the ſacrifices a phyſician is obliged to make of eaſe, ſociety, and even health, to his profeſſion; and when we add to theſe, the conſtant and painful anxiety which is connected with the important charge of the lives of our fellow-creatures, and above all, the ineſtimable value of that bleſſing which is the object of his ſervices, I hardly know how it is poſſible for a patient ſufficiently and juſtly to reward his phyſician. But when we conſider, on the other hand, that ſickneſs deprives men of the means of acquiring money; that it increaſes all the expences of living; and that high charges often drive patients from regular-bred phyſicians to quacks; I ſay, when we attend to theſe conſideratious, we ſhould make our charges as moderate as poſſible, and conform them to the following ſtate of things.

Avoid meaſuring your ſervices to your patients by ſcruples, drachms, and ounces. It is an illiberal mode of charging. On the contrary, let the number and *time* of your viſits, the nature of your patient's diſeaſe, and his rank in his family or ſociety,

ciety, determine the figures in your accounts. It is certainly juſt to charge more for curing an apoplexy, than an intermitting fever. It is equally juſt, to demand more for riſking your life by viſiting a patient in a contagious fever, than for curing a pleuriſy, You have a right likewiſe to be paid for your anxiety. Charge the ſame ſervices, therefore, higher to the maſter or miſtreſs of a family, or to an only ſon or daughter, who call forth all your feelings and induſtry, than to leſs important members of a family and of ſociety. If a rich man demands more frequent viſits than are neceſſary, and if he impoſes the reſtraints of keeping to hours by calling in other phyſicians to conſult with you upon every trifling occaſion, it will be juſt to make him pay accordingly for it. As this mode of charging is ſtrictly agreeable to reaſon and equity, it ſeldom fails of according with the reaſon and ſenſe of equity of our patients Accounts made out upon theſe principles, are ſeldom complained of by them. I ſhall only remark further upon this ſubject, that the ſooner you ſend in your accounts after your patients recover, the better. It is the duty of a phyſician to inform his patient of the amount of his obligation to him at leaſt *once* a year. But there are times when a departure from this rule may be neceſſary. An unexpected miſfortune in buſineſs, and a variety of other accidents, may deprive a patient of the money he had allotted to pay his phyſician. In this caſe, delicacy and humanity require, that he ſhould not know the amount of his debt to his phyſician, till time had bettered his circumſtances.

I ſhall only add, under this head, that the poor of every deſcription ſhould be the objects of your peculiar care. Dr. Boerhaave uſed to ſay, "they "were his beſt patients, becauſe God was their "paymaſter." The firſt phyſicians that I have known, have found the poor the ſteps by which they have aſcended to buſineſs and reputation. Diſeaſes among the lower claſs of people are generally ſimple, and exhibit to a phyſician the beſt caſes of all epidemics, which cannot fail of adding to his ability of curing the complicated diſeaſes of the rich and intemperate. There is an inſeparable connection between a man's duty and his intereſt. Whenever you are called, therefore, to viſit a poor patient, imagine you hear the voice of the good Samaritan ſounding in your ears, "Take care of "him and I will repay thee."

I come now to the ſecond part of this addreſs, which was to point out the beſt mode to be purſued, in the further proſecution of your ſtudies, and the improvement of medicine.

I. Give

I. Give me leave to recommend to you, to open all the dead bodies you can, without doing violence to the feelings of your patients, or the prejudices of the common people. Preſerve a regiſter of the weather, and of its influence upon the vegetable productions of the year. Above all, record the epidemics of every ſeaſon; their times of appearing and diſappearing, and the connection of the weather with each of them. Such records, if publiſhed, will be uſeful to foreigners, and a treaſure to poſterity. Preſerve, likewiſe, an account of chronic caſes. Record the name, age and occupation of your patient; deſcribe his diſeaſe accurately, and the changes produced in it by your remedies; mention the doſes of every medicine you adminiſter to him. It is impoſſible to tell how much improvement and facility in practice you will find from following theſe directions. It has been remarked, that phyſicians ſeldom remember more than the two or three laſt years of their practice. The records which have been mentioned, will ſupply this deficiency of memory, eſpecially in that advanced ſtage of life when the advice of phyſicians is ſuppoſed to be moſt valuable.

II. Permit me to recommend to you further, the ſtudy of the anatomy (if I may be allowed the expreſſion) of the human mind, commonly called metaphyſics. The reciprocal influence of the body and mind upon each other, can only be aſcertained by an acurate knowledge of the faculties of the mind, and of their various modes of combination and action. It is the duty of phyſicians to aſſert their prerogative, and to reſcue the mental ſcience from the uſurpations of ſchoolmen and divines. It can only be perfected by the aid and diſcoveries of medicine. The authors I would recommend to you upon metapyſics, are, Butler, Locke, Hartley, Reid, and Beattie. Theſe ingenious writers have cleared this ſublime ſcience of its technical rubbiſh, and rendered it both intelligible and uſeful.

III. Let me remind you, that improvement in medicine is not to be derived only from colleges and univerſities. Syſtems of phyſic are the productions of men of genius and learning; but thoſe facts which conſtitute real knowledge, are to be met with in every walk of life. Remember how many of our moſt uſeful remedies have been diſcovered by quacks. Do not be afraid, therefore, of converſing with them, and of profiting by their ignorance and temerity in the practice of phyſic. Medicine has its Phariſees, as well as religion. But the ſpirit of this ſect is as unfriendly to the advancement of medicine, as it is to chriſtian charity.

rity. By converſing with quacks, we may convey inſtruction to them, and thereby leſſen the miſchief they might otherwiſe do to ſociety. But further.—In the purſuit of medical knowledge, let me adviſe you to converſe with nurſes and old women. They will often ſuggeſt facts in the hiſtory and cure of diſeaſes which have eſcaped the moſt ſagacious obſervers of nature. Even Negroes and Indians have ſometimes ſtumbled upon diſcoveries in medicine. Be not aſhamed to inquire into them. There is yet one more means of information in medicine which ſhould not be neglected, and that is, to converſe with perſons who have recovered from indiſpoſitions without the aid of phyſicians. Examine the ſtrength and exertions of nature in theſe caſes, and mark the plain and home-made remedy to which they aſcribe their recovery. I have found this to be a fruitful ſource of inſtruction, and have been led to conclude, that if every man in a city, or a diſtrict, could be called upon to relate to perſons appointed to receive and publiſh his narrative, an exact account of the effects of thoſe remedies which accident or whim has ſuggeſted to him, it would furniſh a very uſeful book in medicine. To preſerve the facts thus obtained, let me adviſe you to record them in a book to be kept for that purpoſe. There is one more advantage that will probably attend the inquiries that have been mentioned; you may diſcover diſeaſes, or ſymptoms of diſeaſes, or even laws of the animal economy, which have no place in our ſyſtems of noſology, or in our theories of phyſic.

IV. Study ſimplicity in the preparation of your medicines. My reaſons for this advice are as follow:

1. Active medicines produce the moſt certain effects in a ſimple ſtate.

2. Medicines when mixed frequently deſtroy the efficacy of each other. I do not include chemical medicines alone in this remark. It applies likewiſe to Galenical medicines. I do not ſay, that all theſe medicines are impaired by mixture, but we can only determine when they are not, by actual experiments and obſervations.

3. When medicines of the ſame claſs, or even of different claſſes, are given together, the *ſtrongeſt* only produces an effect. But what are we to ſay to a compound of two medicines which give exactly the ſame impreſſion to the ſyſtem? Probably,

if we are to judge from analogy, the effect of them will be ſuch as would have been produced by neither, in a ſimple ſtate.

4. By obſerving ſimplicity in your preſcriptions, you will always have the command of a greater number of medicines of the *ſame* claſs, which may be uſed in ſucceſſion to each other, in proportion as habit renders the ſyſtem inſenſible of their action.

5. By uſing medicines in a ſimple ſtate you will obtain an exact knowledge of their virtues and doſes, and thereby be able to decide upon the numerous and contradictory accounts which exiſt in our books, of the character of the *ſame* medicines.

Under this head, I cannot help adding two more directions.

1. Avoid ſacrificing too much to the *taſte* of your patients in the preparation of your medicines. The nature of a medicine may be wholly changed by being mixed with ſweet ſubſtances. The author of nature ſeems to have had a deſign, in rendering medicines unpalatable. Had they been more agreeable to the taſte, they would probably

have yielded long ago to the unbounded appetite of man, and by becoming articles of diet, or condiments, have loſt their efficacy in diſeaſes.

2. Give as few medicines as poſſible in tinctures made with diſtilled ſpirits. Perhaps there are few caſes in which it is ſafe to exhibit medicines prepared in ſpirits, in any other form than in *drops*. Many people have been innocently ſeduced into a love of ſtrong drink, from taking large or frequent doſes of bitters infuſed in ſpirits. Let not our profeſſion be reproached in a ſingle inſtance, with adding to the calamities that have been entailed upon mankind by this dreadful ſpecies of intemperance.

V. Let me recommend to your particular attention, the indigenous medicines of our country. Cultivate or prepare as many of them as poſſible, and endeavour to enlarge the materia medica, by exploring the untrodden fields and foreſts of the United States. The ipecacuanha, the Seneka and Virginia ſnake-roots, the Carolina pink-root, the ſpice-wood, the ſaſſafras, the butter-nut, the thoroughwort, the poke, and the ſtrammonium are but a ſmall part of the medicinal productions of America. I have no doubt but there are many hundred other plants which now exhale invaluable medicinal virtues in the deſert air. Examine, likewiſe, the mineral waters, which are ſo various in their impregnation, and ſo common in all parts of our country. Let not the properties of the inſects of America eſcape your inveſtigation. We have already diſcovered among ſome of them, a fly equal in its bliſtering qualities to the famous fly of Spain. Who knows but it may be reſerved for America to furniſh the world, from her productions, with cures for ſome of thoſe diſeaſes which now elude the power of medicine? Who knows but that, at the foot of the Allegany mountain there blooms a flower that is an infallible cure for the epilepſy? Perhaps on the Monongahela, or the Potowmac, there may grow a root that ſhall ſupply by its tonic powers, the invigorating effects of the ſavage or military life in the cure of conſumptions. Human miſery of every kind is evidently on the decline. Happineſs, like truth, is an unit. While the world, from the progreſs of intellectual, moral and political truth, is becoming a more ſafe and agreeable abode for man, the votaries of medicine ſhould not be idle. All the doors and windows of the temple of nature have been thrown open by the convulſions of the late American revolution. This is the time, therefore, to preſs upon her altars. We have already drawn from them diſcoveries in morals, philoſophy, and government; all of which have human happineſs for their object. Let us preſerve the unity of truth and happineſs, by drawing from the ſame ſource, in the preſent critical moment, a knowledge of antidotes to thoſe diſeaſes which are ſuppoſed to be incurable.

I have now, Gentlemen, only to thank you for the attention with which you have honoured the courſe of lectures which has been delivered to you, and to aſſure you, that I ſhall be happy in rendering you all the ſervices that lie in my power, in any way you are pleaſed to command me. Accept of my beſt wiſhes for your happineſs, and may the bleſſings of hundreds and thouſands that were ready to periſh, be your portion in life, your comfort in death, and your reward in the world to come.

THE END.